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# NEW AND NOTEWORTHY ADDITIONS TO THE ARKANSAS FERN FLORA

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## ABSTRACT

Since 1995, 11 fern taxa have been added to the Arkansas flora as new and native, including *Asplenium montanum*, *A. ruta-muraria*, *A. septentrianale*, *A.* ×*trudellii*, *Athyrium angustum*, *Azolla caroliniana*, *Dryopteris goldiana*, *D. celsa* × *goldiana*, *Marsilea macropoda*, *Palhinhaea cernua*, and *Trichomanes intracatum*. Of the reported Arkansas native ferns, one was deleted (*Azolla caroliniana*), being subsumed by *Azolla mexicana* and now correctly known as *Azolla microphylla*. Since 1995, 20 fern taxa have been added to the Arkansas fern flora as new and naturalized, including *Arachnioides simplicior*, *Athyrium nipponicum* 'Pictum', *Cyrtomium falcatum*, *C. fortunei*, *Dryopteris erythrospora*, *Hypolepis tenuifolia*, *Marsilea mutica*, *M. quadrifolia*, *Matteuccia struthiopteris*, *Nephrolepis exaltata*, *Polystichum tsus-sinense*, *Phegopteris decursive-pinnata*, *Salvinia minima*, *S. molesta*, *Selaginella braunii*, *S. kraussiana*, *S. k.* 'Aurea', *S. k.* 'Brownii', *S. k.* 'Goldtips', and *S. uncinata*. Of the reported Arkansas naturalized ferns, one was deleted (*C. fortunei*), being without a known voucher. There are now 97 native and 24 naturalized fern taxa known and documented in the Arkansas fern flora. The total Arkansas fern flora is now 121 taxa documented with 3019 county-level occurrence records. Noteworthy update records and comments are reported for 79 of 97 Arkansas native species and 25 Arkansas naturalized species.
**KEY WORDS**: Arkansas, ferns, county distribution

Over the last 30 years, studies have been conducted to document the diversity and abundance of the Arkansas fern [pteridophyte] flora. Taylor and Demaree (1979) presented a flora of 74 taxa with 1335 county-level occurrence records documented with herbarium citations and dot maps. Peck and Taylor (1995) presented a flora of 92 taxa with 2224 county-level occurrence records supported with dot maps. Since then a series of reports have provided updates on some of the new and noteworthy additions since Peck and Taylor (1995), including *Palhinhea cernua* (Bray 1996), *Salvinia minima* (Peck 1999, 2001; Peck & Serviss 2006), *Dryopteris goldiana* and *D. celsa x goldiana* (Peck, Witsell, & Hendrix 2000; Peck 2000), *Nephrolepis exaltata* (Peck 2002), *Azolla caroliniana*, *Cyrtomium falcatum* and *C. fortunei* (Peck 2003), and *Dryopteris erythrosora* and *Marsilea quadrifolia* (Simpson, Witsell, Crank, & Peck 2008; Serviss & Peck 2008). Even so, a large backlog of additions, range extensions, and noteworthy updates has accumulated for native and non-native taxa, making a new summary essential.

These increases reflect 1) improved knowledge of species apparently rare and local in Arkansas, 2) recognition of and searches for species that are difficult to separate from sister species, 3) continued targeting of species overlooked or under collected by general collectors, 4) continued field emphasis on moderated or sheltered rock house outcrops, timberland barrow pits, and wetland habitats, and 5) a concerted effort to examine and document fern cultivation as a potential source of adventives

that might escape and become naturalized. This report delineates and summarizes these additions. The Arkansas fern flora now consists of 121 taxa documented with 3019 county-level occurrence records.

## NATIVE SPECIES

SOUTHERN MAIDENHAIR FERN – **Adiantum capillis-veneris** L. (Adiantaceae)—This fern was known from 28 counties in Arkansas (Peck & Taylor 1995) with a stronger presence in the Ozark Region than in the Ouachita Region. Two localities (Pulaski and Yell counties) in the Ouachita Region and one in the Ozark Region were added. This species is now known from 32 counties in Arkansas.

Voucher specimens: **ARKANSAS. Perry Co.**: *Peck 95127* (BRIT). **Pulaski Co.**: *Stephens 2002005* (BRIT). **Sharp Co.**: *Davis 5* (STAR). **Yell Co.**: *Peck 99507* (BRIT).

POWDERY CLOAK FERN -- **Argyrochosma dealbata** (Pursh) Windham (Pteridaceae)—Previously known from 6 counties in northern Arkansas (Peck & Taylor 1995), three more counties are now known to support populations of this fern. This species is now known from 9 counties in Arkansas.

Voucher specimens: **ARKANSAS. Fulton Co.**: *Peck 2008700* (BRIT). **Marion Co.**: *Witsell 050128* (ANHC). **Madison Co.**: *Witsell 020753* (ANHC).

BRADLEY'S SPLEENWORT – **Asplenium bradleyi** D,C. Eaton (Aspleniaceae)—Known from 30 counties in Arkansas (Peck & Taylor 1995), 7 more Ozark Region counties in northeastern Arkansas were added. This species is now known from 37 counties in Arkansas.

Voucher specimens: **ARKANSAS. Clark Co.**: *Vearrier 292* (HEND). **Crawford Co.**: *Peck 86712* (BRIT). **Faulkner Co.**: *Peck 87742* (BRIT). **Lawrence Co.**: *Peck 86528* (BRIT). **Randolph Co.**: *Peck 86534* (BRIT). **Sebastian Co.**: *Peck 86720* (BRIT). Scott Co.: *Peck 86733* (BRIT). **Sharp Co.**: *Peck 86524* (BRIT). **White Co.**: *Engel sn* (HARD).

MOUNTAIN SPLEENWORT – **Asplenium montanum** Willd. (Aspleniaceae)—This species occurs east of the Mississippi River. In 1960 F. Dunlap collected the first specimen west of the Mississippi River in Montgomery Co., MO (Key & Redfearn 1973), a station now considered destroyed by road construction. A plant was discovered in 2002 growing on fractured novaculite in a deep ravine on the north side of Spanish Mountain in Garland Co., AR, and another in 2008 at a rock house environment along Sylamore Creek, Stone County, AR. Rock house environments simulate 'Tertiary' or 'Tropical' microclimatic moderation (Farrar, 1998) providing conditions that favor 'vegetational inertia' (Cole 1985) retain species longer at what now has become their peripheral or extra-limital range (Farrar 1992). This is the first report of the species for Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2008781* (BRIT). **Stone Co.**: *Peck 2008680* (BRIT).

LOBED SPLEENWORT – **Asplenium pinnatifidum** Nutt. (Aspleniaceae)—This species was formed from the hybrid of *A. rhizophyllum* × *montanum* (Wagner 1954), a cross that occurred many times over eastern USA (Werth, Guttman, & Eshbaugh 1985). The sterile hybrid [not known in nature] underwent a doubling of its chromosome number to become a fertile tetraploid species. Peck and Taylor (1995) reported it from nine counties. Another 15 counties are reported here. While the first parent is fairly

widespread across upland Arkansas, the second parent is not, suggesting that much of the presence of this species reflects spore dispersal from other tetraploid plants, rather than multiple origins from independent hybrid origins within Arkansas.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 1997299* (BRIT). **Boone Co.**: *Peck 1997274* (BRIT). **Carroll Co.**: *Peck 1997261* (BRIT). **Fulton Co.**: *Peck 1996314* (BRIT). **Hot Spring Co.**: *Peck 1996479* (BRIT). **Johnson Co.**: *Johnson 5259* (APCR). **Logan Co.**: *Peck 1998117* (BRIT). **Madison Co.**: *Peck 1997240* (BRIT). **Marion Co.**: *Peck 1997283* (BRIT). **Montgomery Co.**: *Peck 86338* (BRIT). **Newton Co.**: *Peck 86409* (BRIT). **Polk Co.**: *Peck 98243* (BRIT). **Pope Co.**: *Peck 86420* (BRIT). **Randolph Co.**: *Peck 1998244* (BRIT). **Sharp Co.**: *Peck 1998299* (BRIT).

EBONY SPLEENWORT – **Asplenium platyneuron** (L.) Britton, Sterns, & Poggenburg (Aspleniaceae)—With this voucher, the species is known from all 75 counties in Arkansas.

Voucher specimen: **ARKANSAS. Cleveland Co.**: *Lunsford 19* (UAM).

BLACK-STEMMED SPLEENWORT – **Asplenium resiliens** Kunze (Aspleniaceae)—Known from 21 counties in the Ozark and Ouachita regions of Arkansas, although much more common to the north in the Ozark Region. To these another 9 counties were added with Clark, Hot Spring, Pike, Pulaski, and Saline counties in the Ouachita region. This species is now known from 30 counties in Arkansas.

Voucher specimens: **ARKANSAS. Clark Co.**: *Peck 86483* (BRIT). **Cleburne Co.**: *Peck 86467* (BRIT). **Hot Spring Co.**: *Peck 86477* (BRIT). **Johnson Co.**: *Johnson 5184* (APCR). **Pike Co.**: *Peck 86480* (BRIT). **Pope Co.**: *Peck 86338* (BRIT). **Pulaski Co.**: *Bullard 94* (BRIT). **Saline Co.**: *Witsell 010124* (ANHC). **Van Buren Co.**: *Peck 86453* (BRIT).

WALKING FERN – **Asplenium rhizophyllum** L. (Aspleniaceae)—Known from 17 counties in Taylor (1984) and 28 counties in Peck and Taylor (1995), this species common across the Ozark Region of Arkansas was subsequently collected in 6 Ouachita Region counties. This species is now known from 34 counties in Arkansas.

Voucher specimens: **ARKANSAS. Clark Co.**: *Peck 86484* (BRIT). **Garland Co.**: *Peck 2008622* (BRIT). **Hot Spring Co.**: *Peck 86478* (BRIT). **Montgomery Co.**: *Peck 2008439* (BRIT). **Pike Co.**: *Peck 86481* (BRIT). **Saline Co.**: *Pelton sn* (HEND).

WALL-RUE FERN – **Asplenium ruta-muraria** L. (Aspleniaceae)—This species in the USA is essentially east of the Mississippi River with western outliers in Iowa and Missouri. The core or metropolitan range is along the Appalachian Mountains wherein it is rare and local. Populations were recently discovered in eastern Ontario (Munro 1988), Labrador, and in eastern Iowa (Cady & Horton 2004). This species was reported spuriously from Arkansas for many decades by many authors citing past literature comments, but no voucher has been cited or found (Peck 2003). Taylor (1982) included it with a wonderful illustration by Paul W. Nelson in his Arkansas fern book in hopes that it might be found at some time in the future in the upper tier of Arkansas counties that contain limestone outcrops and proximity to known populations in the southern row of Missouri counties (Yatskievych 2000). The species was found growing on exposed limestone outcrops in Fulton Co., Arkansas, in 2002 and was still present 6 years later. This is the first vouchered Arkansas report for this species.

Voucher specimen: **ARKANSAS. Fulton Co.**: *Peck 2008701* (BRIT).

FORKED SPLEENWORT – **Asplenium septentrionale** (L.) Hoffmann (Aspleniaceae)—The species's metropolitan range is essentially the western USA with mid-continental periphery in western portions of South Dakota, Colorado, Oklahoma, and Texas with eastern outliers known from Monroe and Hardy counties in West Virginia (Bush 1986). Plants of this species were discovered in 2003 near the summit plateau on the northwest end of Magazine Mountain, Logan County, AR, some 400 km east of its occurrence in Texas. The fronds were embedded to nearly covered within Reindeer 'Moss' *Cladonia*, White Moss, *Leucobryum*, and Tree Moss, *Climacium americanum*, growing thickly on an acid, thin, clay-shale mineral soil overlaying sandstone bedrock within 5 m of the cliff face. This is the first Arkansas report for this species.

Voucher specimen: **ARKANSAS. Logan Co.**: *Peck 2008657* (BRIT).

MAIDENHAIR SPLEENWORT – **Asplenium trichomanes** L. subsp. **trichomanes** (Aspleniaceae)—Known from 33 counties in Arkansas, this species is reported from 6 more counties in the Ouachita (3) and Ozark (3) regions of Arkansas. This species is now known from 39 counties in Arkansas.

Voucher specimens: **ARKANSAS. Clark Co.**: *Peck 2009913* (BRIT). **Lawrence Co.**: *Peck 86528* (BRIT). **Pike Co.**: *Peck 2009903* (BRIT). **Randolph Co.**: *Peck 86534* (BRIT). **Saline Co.**: *Peck 2009918* (BRIT). **Sharp Co.**: *Peck 86534* (BRIT).

SCOTT'S SPLEENWORT – **Asplenium ×ebenoides** R.R. Scott [*A. platyneuron* × *rhizophyllum*] (Aspleniaceae)—This hybrid spleenwort occurs as both sterile or fertile plants, the latter having a doubled chromosome number and producing viable spores through normal meiosis (Walter, Wagner, & Wagner 1982), with fertile plants known only from Hale Co., Alabama. This hybrid is known from three counties in Arkansas (Peck & Taylor 1995). The plant was first discovered in Arkansas by David Johnson in 1979 at Haw Creek Falls, Pope Co. and was removed completely when vouchered. Searches in the 1980s, 90s, and in 2008 were not productive in an attempt to locate hybrid plants at this locality. The second population was discovered at a city park at Batesville, Independence Co., AR, and is somewhat protected. The third population, located at the top of East Mountain overlooking Gulpha Gorge, occurring at Hot Springs National Park, Garland Co., was still present in 2008. The first voucher taken in 1985 produced viable spores, while the most recent taken in 2008 did not. Thus, a mixed hybrid population might be present, similar to that at Hale Co., AL, requiring additional study.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 1985113, 1986333, 2008745* (BRIT). **Independence Co.**: *Smitt sn* (UAM). **Pope Co.**: *Johnson 7908* (HXC).

GRAVES' SPLEENWORT – **Asplenium ×gravesii** Maxon [*A. bradleyi* × *pinnatifidum*] (Aspleniaceae)—This rare hybrid was reported from Garland Co., AR, for the first time by Werth and Taylor (1980). Subsequently, an overlooked population in adjacent Montgomery County was discovered as an herbarium specimen, but a field search at Little Missouri Falls failed to locate plants (Peck & Taylor 1995). In 2004 a third location in a third county, 260 km to the north in the Leatherwood Wilderness Area of the Ozark National Forest, was discovered near Big Flat, Baxter Co., AR. The plant occurred on a fractured chert outcrop near the bottom of a 600 foot deep ravine 300 m distant from a rock breakdown with cool blowing air flow. The parent species were nearby. The plant has persisted 7 years at this location.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 2008696* (BRIT). **Garland Co.**: *Peck 1986332* (BRIT). **Montgomery Co.**: *Thomas 100549* (UAM).

TRUDELL'S SPLEENWORT – **Asplenium ×trudellii** Wherry [*A. montanum* × *pinnatifidum*] (Aspleniaceae)—This sterile triploid backcross hybrid is exceptional (Wagner 1954; Walter, Wagner, & Wagner 1982). It is found in significant populations that "must have some means of propagation although the spores are highly abortive and meiosis involves both univalents and bivalents." All other sterile triploid backcross hybrids are found sparingly with few plants evident. In 2005 a population was located in the Leatherwood Wilderness Area of the Ozark National Forest, being discovered at the bottom of a 600 feet ravine on breakdown rubble. The Arkansas population is the first discovered west of the Mississippi River, the closest in Illinois or Tennessee, some 400 km distant to the northeast or east. It is likely that the occurrence of this extra-limital plant is in part explained by the rockhouse-like microhabitat (Farrar 1998) affording some environmental inertia (Cole 1985) that simulates conditions to the north and east, protecting the plants from hot and dry summer conditions experienced in the uplands.

Voucher specimen: **ARKANSAS. Baxter Co.**: *Peck 2008693* (BRIT).

NORTHERN LADY FERN – **Athyrium angustum** (Willd.) G. Lawson (Dryopteridaceae)—This fern species was overlooked in Arkansas. It occurs throughout the upland counties of Arkansas mixed with the Southern Lady Fern *Athyrium aspenioides*. Both species were treated as varieties of *A. filix-femina* (Butters 1917) based on the perception that they are difficult to distinguish (Benedict 1934; Liew 1972). Yet they co-occur in mixed populations from Arkansas to Virginia and maintain their morphological differences. Based on allozymes and spore morphology, sufficient divergence exists between these taxa to warrant distinction at least to subspecies or species rank (Kelloff, Skog, Adamkewicz, & Werth 2002). Both taxa occur in Arkansas, yet only *A. asplenioides* has been reported previously. These 27 Arkansas county records extend the southwestern corner of the range by 300 km.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 2010082* (BRIT). **Boone Co.**: *Peck 2009569* (BRIT). **Carroll Co.**: *Peck 2010646* (BRIT). **Clark Co.**: *Peck 2009585* (BRIT). **Cleburne Co.**: *Peck 2009590* (BRIT). **Fulton Co.**: *Peck 2010081* (BRIT). **Garland Co.**: *Peck 2009581* (BRIT). **Hot Spring Co.**: *Peck 2009587* (BRIT). **Independence Co.**: *Peck 2010644* (BRIT). **Izard Co.**: *Peck 2010110* (BRIT). **Jackson Co.**: *Peck 2010645* (BRIT). **Johnson Co.**: *Peck 2009584* (BRIT). **Lawrence Co.**: *Peck 2010643* (BRIT). **Logan Co.**: *Peck 2009580* (BRIT). **Marion Co.**: *Peck 2009568* (BRIT). **Madison Co.**: *Peck 2009571* (BRIT). **Montgomery Co.**: *Peck 2009582* (BRIT). **Newton Co.**: *Peck 2009570* (BRIT). **Pike Co.**: *Peck 2009586* (BRIT). **Polk Co.**: *Peck 2009583* (BRIT). **Pope Co.**: *Peck 2009566* (BRIT). **Randolph Co.**: *Peck 2010642* (BRIT). **Searcy Co.**: *Peck 2009567* (BRIT). **Sharp Co.**: *Peck 2010641* (BRIT). **Stone Co.**: *Peck 2010080* (BRIT). **White Co.**: *Peck 2009589* (BRIT).

MOSQUITO FERN – **Azolla microphylla** Kaulf. (Azollaceae)— All Arkansas material (Peck and Taylor 1995) was traditionally referred to as *Azolla mexicana* C. Presl until recently when some specimens were assigned to *A. caroliniana* Willd. (Peck 2003). Recent herbarium and molecular studies (Mickel and Smith 2004, Reid, Plunkett, & Peters 2006) showed that *Azolla microphylla was* a valid, older name than *A. mexicana* and that it was conspecific with *A. caroliniana*. Thus, all material from Arkansas is now reported as *A. microphylla*. The species is known from 60 of Arkansas's 75 counties, almost to the exclusion of the northern two rows of upland counties.

Voucher specimens: **ARKANSAS. Ashley Co.**: *Peck 2009223* (BRIT). **Bradley Co.**: *Roberts 17* (BRIT). **Chicot Co.**: *Thomas 163744* (BRIT). **Cleburne Co.**: *Peck 2010006* (BRIT). **Cleveland Co.**: *Smith 17* (BRIT). **Columbia Co.**: *Markson 84* (BRIT). **Cross Co.**: *Peck 2010028* (BRIT). **Dallas Co.**: *Smith 5* (BRIT). **Drew Co.**: *Demaree 17625* (BRIT). **Grant Co.**: *Smith 29* (BRIT). **Howard Co.**: *Sweet 6* (BRIT). **Lafayette Co.**: *Sweet 12* (BRIT). **Little River Co.**: *Sweet 24* (BRIT). **Miller Co.**: *Lipscomb 2064* (BRIT). **Nevada Co.**: *Dorcas 12* (BRIT). **Ouachita Co.**: *Thomas 6673* (BRIT). **Pike Co.**: *Rogers 12* (BRIT). **Poinsett Co.**: *Peck 2010018* (BRIT). **Polk Co.**: *Peck 2010065* (BRIT). **Saline Co.**: *Neal 12* (BRIT). **Scott Co.**: *Peck 2010067* (BRIT). **Sevier Co.**: *Dorcas 41* (BRIT). **Van Buren Co.**: *Peck 2010005* (BRIT). **White Co.**: *Roberts 55* (BRIT). **Woodruff Co.**: *Roberts 85* (BRIT).

DISSECTED GRAPEFERN – **Botrychium disectum** Sprengel f. **dissectum** (Ophioglossaceae)—This form was first reported from Arkansas by Buchholz and Palmer (1926). This form is more distinct and easier to distinguish than it is to separate the species of Grape Ferns from each other. McCauley, Whittier, and Reilly (1985) studied the inbreeding and self-fertilization of this species, while Montgomery (1990) studied the constancy of frond morphology and survivorship and predations changes of five populations in Pennsylvania. Barker and Hauk (2003) commented on molecular markers and the systematics of this and allied species. The form is far more common and abundant in the upper Midwest. While far less common than the non-skeletonized typical frond plants in Arkansas, plants with skeletonized form appear in about 5% of the populations and range from 1% to 20% of local plants. In the Ozark Region the form favors lowland woods, floodplain terraces, and areas that retain water for a week or more in swamp conditions. These wetter habitats have a soil high in humus often over a somewhat impervious mineral layer or clay. With the following 20 records, this fern is now known from 25 counties in Arkansas.

Voucher specimens: **ARKANSAS. Boone Co.**: *Peck 2000146* (BRIT). **Carroll Co.**: *Peck 2000138* (BRIT). **Conway Co.**: *Peck 2009409* (BRIT). **Crawford Co.**: *Peck 2009391* (BRIT). **Fulton Co.**: *Peck 200078* (BRIT). **Garland Co.**: *Peck 1996372* (BRIT). **Izard Co.**: *Peck 200083* (BRIT). **Johnson Co.**: *Kirshberger 102* (UAM). **Lawrence Co.**: *Peck 20000118* (BRIT). **Madison Co.**: *Wages sn* UCAC). **Marion Co.**: *Peck 2000114* (BRIT). **Perry Co.**: *Peck 2009399* (BRIT). **Polk Co.**: *Ewing sn* BRIT). **Pope Co.**: *Peck 2009403* (BRIT). **Randolph Co.**: *Peck 2000211* (BRIT). **Scott Co.**: *Peck 2009395* (BRIT). **Searcy Co.**: *Peck 2000096* (BRIT). **Sebastian Co.**: *Peck 2009393* (BRIT). **Sharp Co.**: *Peck 2000101* (BRIT). **Yell Co.**: *Peck 2009397* (BRIT).

OBLIQUE DISSECTED GRAPEFERN – **Botrychium dissectum** Sprengel f. **obliquum** (Muhl.) Fern. (Ophioglossaceae)—With this voucher, the non-dissected form is known from all 75 counties of Arkansas.

Voucher specimen: **ARKANSAS. Madison Co.**: *Wirges sn* (UCAC).

ALABAMA LIP FERN – **Cheilanthes alabamense** (Buckl.) Kunze (Pteridaceae)—This species is now known from 13 counties in Arkansas, with all but one county in the Ozark Region. The Saline County collection by Theo Witsell is the second county report for the Ouachita Region. With these 2 vouchers the species is now known from 15 counties in Arkansas.

Voucher specimens: **ARKANSAS. Independence Co.**: *Davis 2448* (APCR). **Saline Co.**: *Witsell 01-0223* (BRIT).

SLENDER LIP FERN – **Cheilanthes feei** Moore (Pteridaceae)—Once only known from 11 counties in Arkansas (Taylor 1984), subsequently reported from 14 counties (Peck & Taylor 1995), and now reported from a total of 20 counties. Significantly, to the one Ouachita Region county (Garland), vouchers from Clark, Montgomery, and Hot Spring counties were added.

Voucher specimens: **ARKANSAS. Clark Co.**: *Peck 2009461* (BRIT). **Cleburne Co.**: *Peck 2009605* (BRIT). **Garland Co.**: *Scully sn* (HSNP), *Letterman sn* (MO). **Hot Spring Co.**: *Peck 2009455* (BRIT). **Montgomery Co.**: Thomas 100549 (NLU). **Sharp Co.**: *Crank 02004* (BRIT).

HAIRY LIP FERN – **Cheilanthes lanosa** (Michx.) D.C. Eaton (Pteridaceae)—This species is now known from 33 counties in Arkansas.

Voucher specimen: **ARKANSAS. Saline Co.**: *Tucker 6464* (APCR).

WOOLLY LIP FERN – **Cheilanthes tomentosa** Link (Pteridaceae)—With these 3 peripheral county vouchers, the range in Arkansas of this species now includes 34 counties.

Voucher specimens: **ARKANSAS. Fulton Co.**: *Peck 200150* (BRIT). **Independence Co.**: *Smith s.n.* (LYON). **Saline Co.**: *Peck 200089* (BRIT).

BULBLET FRAGILE FERN – **Cystopteris bulbifera** (L.) Bernh. (Dryopteridaceae)—This species is noted for its vegetative propagation from leaf bulblets that abscise and form new plants. The species favors limestone or dolomite cliffs and calcareous sandstone and shales. Nineteen counties, mainly in the Ozark Region, were known to support populations of this species (Peck & Taylor 1995). Six more Ozark counties were added. This species is now known from 25 counties in Arkansas.

Voucher specimens: **ARKANSAS. Cleburne Co.**: *Peck 1999570* (BRIT). **Crawford Co.**: *Peck 2010079* (BRIT). **Franklin Co.**: *Peck 2020074* (BRIT). **Lawrence Co.**: *Peck 2010008* (BRIT). **Randolph Co.**: *Peck 2010074* (BRIT). **Sebastian Co.**: *Peck 2010076* (BRIT).

SOUTHERN FRAGILE FERN – **Cystopteris protrusa** (Weatherby) Blasdell (Dryopteridaceae)—
The protruding rhizome separates this species from other *Cystopteris*. This species favors the toe slope of moist, north-facing slopes with high humus soil. The species was known from 39 counties in Arkansas (Peck & Taylor 1995) with another 19 counties reported here. This species is now known from 58 counties in Arkansas.

Voucher specimens: **ARKANSAS. Boone Co.**: *Peck 1999118* (BRIT). **Clark Co.**: *Peck 2010063* (BRIT). **Clay Co.**: *Peck 2010011* (BRIT). **Cleburne Co.**: *Peck 1999576* (BRIT). **Crawford Co.**: *Peck 1986821* (BRIT). **Cross Co.**: *Peck 2010030* (BRIT). **Faulkner Co.**: *Peck 2010004* (BRIT). **Franklin Co.**: *Peck 1986812* (BRIT). **Fulton Co.**: *Peck 1988314* (BRIT). **Hempstead Co.**: *Witsell 07113* (ANHC). **Izard Co.**: *Peck 198812* (BRIT). **Jackson Co.**: *Peck 2010023* (BRIT). **Lee Co.**: *Peck 2010037* (BRIT). **Marion Co.**: *Peck 1988324* (BRIT). **Perry Co.**: *Peck 2010070* (BRIT). **Pulaski Co.**: *Peck 2010002* (BRIT). **Saline Co.**: *Carneal 120* (BRIT). **Sebastian Co.**: *Peck 1986944* (BRIT). **Yell Co.**: *Peck 1998074* (BRIT).

TENNESSEE BLADDER FERN – **Cystopteris tennesseensis** Shaver (Dryopteridaceae)—
Shaver (1950) first recognized this allotetraploid as distinct from other *Cystopteris* with many of its features intermediate between its parents (Moran 1982; Haufler, Windham, & Ranker 1990). This

species is common across the Ozark Region and was known from 29 counties in Arkansas (Peck & Taylor 1995). Another 13 counties are reported here. This species is now known from 42 counties in Arkansas.

Voucher specimens: **ARKANSAS. Cleburne Co.**: *Peck1999574* (BRIT). **Crawford Co.**: *Peck 1986820* (BRIT). **Faulkner Co.**: *2009412* (BRIT). **Franklin Co.**: *Peck 1986811* (BRIT). **Garland Co.**: *Peck 2009425* (BRIT). **Perry Co.**: *Peck 2009408* (BRIT). **Polk Co.**: *Peck 1986807* (BRIT). **Pulaski Co.**: *Peck 2009431* (BRIT). **Saline Co.**: *Peck 2009435* (BRIT). **Searcy Co.**: *Taylor 2576* (UARK). **Sebastian Co.**: *Peck 1986943* (BRIT). **White Co.**: *Peck 2009418* (BRIT). **Yell Co.**: 1998082 (BRIT).

MacKay's Fragile Fern – **Cystopteris tenuis** (Michx.) Desv. (Dryopteridaceae)—Although first recognized in 1889 as a variety (Blasdell 1963), Lellinger (1981), Moran (1983) and Haufler and Windham (1991) clarified that this *Cystopteris* is a tetraploid species formed as a result of hybridization between *C. protrusa* and another unknown *Cystopteris*. Overlooked in Arkansas until Peck and Taylor (1995) reported it based on herbaria specimens from two counties in the Ozark Region, the species was since documented from an additional 28 counties in the Ozark and Ouachita regions of Arkansas. This species is now known from 30 counties in Arkansas.

Voucher specimens: **ARKANSAS. Baxter** Co.: *Peck 1999150* (BRIT). **Benton Co.**: *Witsell 010801* (ANHC). **Boone Co.**: *Peck 1999120* (BRIT). **Carroll Co.**: *1999134* (BRIT). **Cleburne Co.**: *Peck 2002014* (BRIT). **Conway Co.**: *Peck 2009410* (BRIT). **Faulkner Co.**: *Peck 2009411* (BRIT). **Franklin Co.**: *Peck 1986816* (BRIT). **Fulton Co.**: *Peck 1999225* (BRIT). **Garland Co.**: *Peck 2009424* (BRIT). **Independence Co.**: *Peck 2000125* (BRIT). **Izard Co.**: *Peck 2000256* (BRIT). **Johnson Co.**: *Peck 1996224* (BRIT). **Logan Co.**: *Peck 2009380* (BRIT). **Madison Co.**: *Peck 1999194* (BRIT). **Marion Co.**: *Peck 198826* (BRIT). **Montgomery Co.**: *Peck 2009381* (BRIT). **Newton Co.**: *Peck 1996217* (BRIT). **Perry Co.**: *Peck 2009409* (BRIT). **Pope Co.**: *Peck 1996234* (BRIT). **Pulaski Co.**: *Peck 2009430* (BRIT). **Randolph Co.**: *Peck 2010233* (BRIT). **Searcy Co.**: *Peck 1996412* (BRIT). **Sharp Co.**: *Peck 201105* (BRIT). **Stone Co.**: *Peck 1996441* (BRIT). **Van Buren Co.**: *Peck 1996462* (BRIT). **White Co.**: *Peck 2009419* (BRIT). **Yell Co.**: *Peck 2009380* (BRIT).

Hybrid Fragile Fern – **Cystopteris bulbifera × tennesseensis** (Dryopteridaceae)—Two specimens of this hybrid were reported by Haufler, Windham and Ranker (1991) for Arkansas from Independence and Newton counties, to which one more county record was added. This hybrid is now known from three counties in Arkansas.

Voucher specimens: **ARKANSAS. Independence Co.** *Thomas 8673* fide Moran (TENN). **Newton Co.**: *Iltis 499* fide Haufler (UARK). **Stone Co.**: *Taylor 2895* fide Peck (UARK).

Hay-scented Fern – **Dennstaedtia punctilobula** (Michx.) Moore (Dennstaedtiaceae)—
Originally discovered in Arkansas by E. J. Palmer (1924) at the top of Magazine Mountain, Logan Co., the population is disjunct from its metropolis or species core to the east and north east. The species is now known from 4 counties in Arkansas, with 2 in the Ozark Region north of the Arkansas River and 2 in the Ouachita Region south of the Arkansas River.

Voucher specimen: **ARKANSAS. Logan Co.**: *Taylor 1046* (SIU), **Montgomery Co.**: (*Oleson 8701* (UARK), **Stone Co.**: Moore 450729 (UARK), **White Co.**: *Speer 386* (UARK).]

SILVERY GLADE FERN – **Deparia acrostichoides** (Swartz) Kato (Dryopteridaceae)—Once known from 8 counties in Arkansas (Peck & Taylor 1995). Four county vouchers are reported here, with two in the Ozark Region and two in the Ouachita Region of Arkansas. This species is now known from 12 counties in Arkansas with four counties in the Ouachita Region and eight counties in the Ozark Region.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 99407* (BRIT). **Garland Co.**: *Crank 95005* (HEND). **Montgomery Co.**: *Marsh 95004* (HEND). **Stone Co.**: *Hendrix sn* (BRIT).

CROWFOOT CLUBMOSS – **Diphasiastrum digitatum** (Lycopodiaceae)—Once known only from 5 counties in Arkansas (Taylor 1984). Peck and Taylor (1995) reported it from 8 counties. With the additional vouchers reported here, the species is now known from 16 counties in Arkansas.

Voucher representations: **ARKANSAS. Baxter Co.**: Peck 99407 (BRIT). **Montgomery Co.**: *Witsell sn* (BRIT). **Newton Co.**: *Crank 08001* (BRIT). **Ouachita Co.**: *Witsell 06500* (ANHC). **Pope Co.**: *Parson sn* (BRIT). **Saline Co.**: *Witsell 07397* (ANHC). **Van Buren Co.**: *Witsell 07014* (ANHC). **Yell Co.**: *Saugey sn* (BRIT).

NARROW-LEAVED GLADE FERN – **Diplazium pycnocarpon** (Michx.) Desv. (Dryopteridaceae)—With this voucher, the species is now known from 22 counties in Arkansas with one county in the Ouachita Region, two along Crowley's Ridge in the east, and 19 Ozark counties.

Voucher specimen: **ARKANSAS. Izard Co.**: *McWilliams 29* (UCAC).

LOUISIANA WOOD FERN – **Dryopteris ludoviciana** (Kunze) Small (Dryopteridaceae)—First discovered in southeastern Arkansas in 1982 at Warren Prairie in Bradley Co. (Sundell, McIntyre, & Peck 1984). Two subsequent discoveries in southwestern Arkansas have raised its known range to 3 counties. The Bradley Co. population was lost to an arson fire.

Voucher specimens: **ARKANSAS. Bradley Co.**: *Peck 84642* (BRIT). **Lafayette Co.**: *Witsell 05036* (ANHC). **Miller Co.**: *Peck 2009177* (BRIT).

GOLDIE'S WOOD FERN – **Dryopteris goldiana** (Hooker ex Goldie) A. Gray (Dryopteridaceae)—The genus *Dryopteris* is well represented in the Arkansas flora with widespread species to rare and local disjunct outliers restricted to hillside seeps or within deep ravines with protected, shaded, north-facing rock outcrops and rockhouses (Peck & Peck 1988; Peck 2000). This species was first reported from Arkansas (Peck, Witsell, & Hendrix 2000) from Baxter Co. in northern Arkansas. Since then, additional populations were discovered in Baxter Co. and three adjacent counties in rugged terrain at the base of steep north-facing slopes. These stations have moderated (more northern-like microclimates) conditions, much like cliff rock houses (Farrar 1998) that provide a strong measure of vegetational inertia (Cole 1985) allowing these plants to persist well to the south and west of the core or metropolis of its range (Werth 1991). The species is now known from four counties in Arkansas.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 99417, 2010082* (BRIT). **Fulton Co.**: *Peck 2010081* (BRIT). **Izard Co.**: *Peck 2010110* (BRIT). **Stone Co.**: *Peck 2010080* (BRIT).

SOUTHERN HYBRID WOOD FERN – **Dryopteris ×australis** (Wherry) Small (Dryopteridaceae) [*D. goldiana* × *ludoviciana*]—This hybrid was known earlier from two counties, Garland and Montgomery, in Arkansas (Peck 2000). Two additional counties were added subsequently and are

reported here (Peck, Witsell, & Hendrix 2000). This hybrid is now known from four counties in Arkansas.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 99701* (BRIT). **Garland Co.**: *Peck 84680* (BRIT). **Montgomery Co.**: *Peck 95096* (BRIT). **Polk Co.**: *Peck 99513* (BRIT).

LEEDS' HYBRID WOOD FERN, PALMER WOOD FERN – **Dryopteris ×leedsii** Wherry (Dryopteridaceae) [*D. celsa* × *marginalis*]—This enigmatic *Dryopteris* was discovered in Van Buren Co. by E.J. Palmer in 1928, which led to 13 names being applied incorrectly to this plant. The fern was "lost" and then rediscovered by W. Carl Taylor (1982) in 1974 at the original location as noted on all herbarium specimens from the 1920s and 1930s by Delzie Demaree (Wagner & Taylor 1976). A second locality was discovered in Baxter Co. (Peck, Witsell, & Hendrix 2000, Peck 2000). This rare hybrid is now known from two counties in Arkansas.

Voucher specimen: **ARKANSAS. Baxter Co.**: *Peck 99704* (BRIT). **Van Buren Co.**: *Peck 99130* (BRIT).

**Dryopteris celsa × goldiana** (Dryopteridaceae)—This rare *Dryopteris* hybrid new to the Arkansas flora was discovered in Baxter Co. in northern Ozark Region of Arkansas (Peck, Witsell, & Hendrix 2000; Peck 2000). It still is known but from one location.

Voucher specimen: **ARKANSAS. Baxter Co.**: *Peck 99513* (BRIT).

FIELD HORSETAIL – **Equisetum arvense** L. (Equisetaceae)—This species was previously known from 12 counties in Arkansas in the Ozark and Crowley's Ridge regions. Here, a single, isolated population of this species was noticed where a timber access road had undergone extensive rehabilitation causing considerable disturbance. This is the first report of this species in the Ouachita Region and this far south in Arkansas. It is very likely that it was unintentionally brought into the site on road construction equipment.

Voucher specimen: **ARKANSAS. Garland Co.**: *Peck 20071535* (BRIT).

COMMON SCOURINGRUSH – **Equisetum hyemale** L. (Equisetaceae)—With these 16 county vouchers, the presence of this species was documented in all 75 Arkansas counties.

Voucher specimens: **ARKANSAS. Ashley Co.**: *Roberts 61* (BRIT). **Bradley Co.**: *Roberts 83* (BRIT). **Calhoun Co.**: *Roberts 27* (BRIT). **Cleveland Co.**: *Markson 117* (BRIT). **Columbia Co.**: *Markson 82* (BRIT). **Dallas Co.**: *Russell sn* (UAM). **Grant Co.**: *Sweet 8* (BRIT). **Howard Co.**: *Sweet 4* (BRIT). **Little River Co.**: *Sweet 22* (BRIT). **Miller Co.**: *Sweet 31* (BRIT). **Nevada Co.**: *Dorcas 8* (BRIT). **Ouachita Co.**: *Dorcas 12* (BRIT). **Pike Co.**: *Dorcas 32* (BRIT). **St. Francis Co.**: *Thomas 131316* (UAM). **Sevier Co.**: *Dorcas 46* (BRIT). **Woodruff Co.**: *Roberts 87* (BRIT).

FERRIS'S SCOURINGRUSH – **Equisetum ×ferrissii** Clute [*E. hyemale* × *laevigatum*] (Equisetaceae)—This hybrid scouringrush was thought to be rare and local across Arkansas, occurring in association with *Equisetum hyemale*, one of its parents. It is now evident that it is far more common and widespread. The hybrid occurs in various disturbed habitats, being particularly favored along waterways in thickets on sandy soils. Characters to separate the hybrid from its species are well

described in Rutz and Farrar (1984). With these 61 county vouchers, the hybrid is now documented in all 75 Arkansas counties.

Voucher specimens: **ARKANSAS. Ashley Co.**: *Peck 2010224* (BRIT). **Baxter Co.**: *Peck 2010200* (BRIT). **Bradley Co.**: *Peck 2010226* (BRIT). **Calhoun Co.**: *Peck 2010177* (BRIT). **Carroll Co.**: *Peck 2010203* (BRIT). **Chicot Co.**: *Peck 2010176* (BRIT). **Clark Co.**: *Peck 2010188* (BRIT). **Cleburne Co.**: *Peck 2010154* (BRIT). **Cleveland Co.**: *Peck 2010178* (BRIT). **Columbia Co.**: *Peck 2010181* (BRIT). **Conway Co.**: *Peck 2010193* (BRIT). **Craighead Co.**: *Peck 2010158* (BRIT). **Crawford Co.**: *Peck 2010197* (BRIT). **Crittenden Co.**: *Peck 2010167* (BRIT). **Cross Co.**: *Peck 2010162* (BRIT). **Dallas Co.**: *Peck 2010179* (BRIT). **Desha Co.**: *Peck 2010175* (BRIT). **Drew Co.**: *Peck 2010225* (BRIT). **Faulkner Co.**: *Peck 2010152* (BRIT). **Franklin Co.**: *Peck 2010195* (BRIT). **Fulton Co.**: *Peck 2010199* (BRIT). **Garland Co.**: *Peck 2010221* (BRIT). **Grant Co.**: *Peck 2010219* (BRIT). **Greene Co.**: *Peck 2010216* (BRIT). **Hempstead Co.**: *Peck 2010183* (BRIT). **Hot Spring Co.**: *Peck 2010221* (BRIT). **Howard Co.**: *Peck 2010186* (BRIT). **Izard Co.**: *Peck 2010201* (BRIT). **Jackson Co.**: *Peck 2010164* (BRIT). **Lafayette Co.**: *Peck 2010228* (BRIT). **Lawrence Co.**: *Peck 2010155* (BRIT). **Lee Co.**: *Peck 2010169* (BRIT). **Lincoln Co.**: *Peck 2010174* (BRIT). **Little River Co.**: *Peck 2010213* (BRIT). **Logan Co.**: *Peck 2010210* (BRIT). **Lonoke Co.**: *Peck 2010218* (BRIT). **Madison Co.**: *Peck 2010214* (BRIT). **Miller Co.**: *Peck 2010184* (BRIT). **Mississippi Co.**: *Peck 2010159* (BRIT). **Monroe Co.**: *Peck 2010170* (BRIT). **Montgomery Co.**: *Peck 2010222* (BRIT). **Nevada Co.**: *Peck 2010182* (BRIT). **Ouachita Co.**: *Peck 2010180* (BRIT). **Perry Co.**: *Peck 2010192* (BRIT). **Pike Co.**: *Peck 2010187* (BRIT). **Poinsett Co.**: *Peck 2010160* (BRIT). **Pope Co.**: *Peck 2010211* (BRIT). **Prairie Co.**: *Peck 2010171* (BRIT). **Randolph Co.**: *Peck 2010156* (BRIT). **St. Francis Co.**: *Peck 2010168* (BRIT). **Saline Co.**: *Peck 2010223* (BRIT). **Scott Co.**: *Peck 2010190* (BRIT). **Searcy Co.**: *Peck 2010206* (BRIT). **Sebastian Co.**: *Peck 2010196* (BRIT). **Sevier Co.**: *Peck 2010185* (BRIT). **Sharp Co.**: *Peck 2010215* (BRIT). **Stone Co.**: *Peck 2010198* (BRIT). **Union Co.**: *Peck 2010227* (BRIT). **Van Buren Co.**: *Peck 2010153* (BRIT). **White Co.**: *Peck 2010217* (BRIT). **Woodruff Co.**: *Peck 2010165* (BRIT). **Yell Co.**: *Peck 2010150* (BRIT).

SMOOTH SCOURINGRUSH – **Equisetum laevigatum** A. Br. (Equisetaceae)—This species was discovered in Arkansas for the first time in 1982 by the author from Sebastian County at the western edge of Arkansas (Taylor 1984). Additional field work along sandy islands, dredge spoil, and sandy terraces of the Arkansas River in the Arkansas valley from Fort Smith to Little Rock has led to the discovery of 5 more stations; a seventh station was found in a roadside ditch adjacent to pastured prairie in extreme northwest Arkansas. Additional populations might occur along the Arkansas River downstream from Little Rock. The species is now known from seven counties in Arkansas.

Voucher specimens: **ARKANSAS. Benton Co.**: *Peck 2009670* (BRIT). **Franklin Co.**: *Peck 2009578* (BRIT). **Johnson Co.**: *Peck 2009577* (BRIT). **Logan Co.**: *Peck 2009579* (BRIT). **Pulaski Co.**: *Peck 2006876* (BRIT). **Sebastian Co.**: *Peck 1982357, 2009580* (BRIT). **Yell Co.**: *Peck 2009576* (BRIT).

SHINING CLUBMOSS – **Huperzia lucidula** (Michx.) Trevisan (Lycopodiaceae)—Arkansas populations are the most southwesterly in the North American range of this species, being disjunct for over 400 km from populations to the north and east. This species is now known from six Ozark Region counties in Arkansas (Peck & Taylor 1995) with the most recent addition being from Baxter Co.

Voucher specimen: **ARKANSAS. Baxter Co.**: *Hendrix sn* (BRIT). **Franklin Co.**: *Peck 96396* (BRIT). **Johnson Co.**: *Peck 96348* (BRIT). **Madison Co.**: *Peck 96414* (BRIT). **Newton Co.**: *Peck 96307* (BRIT). **Stone Co.**: *Peck 81176* (BRIT).

BUTLER'S QUILLWORT – **Isoetes butleri** Engelmann (Isoetaceae)—Once known from 11 counties (Taylor 1984), subsequently raised to 24 counties (Peck & Taylor 1995), now known from 41 counties widely spread across the Ozark and Ouachita regions.

Voucher specimens: **ARKANSAS. Boone Co.**: *Peck 98044* (BRIT). **Clark Co.**: *Peck 2010062* (BRIT). **Cleburne Co.**: *Peck 98061* (BRIT). **Crawford Co.**: *Peck 2010077* (BRIT). **Fulton Co.**: *Peck 98048* (BRIT). **Independence Co.**: *Peck 98066* (BRIT). **Hempstead Co.**: *Peck 2010054* (BRIT). **Hot Spring Co.**: *Peck 98074* (BRIT). **Howard Co.**: *Peck 2010058* (BRIT). **Johnson Co.**: *Peck 2010072* (BRIT). **Pike Co.**: *Peck 2010060* (BRIT). **Saline Co.**: *Walker sn* (BRIT). **Searcy Co.**: *Peck 98088* (BRIT). **Sevier Co.**: *Peck 2010056* (BRIT). **Van Buren Co.**: *Peck 98055* (BRIT). **Washington Co.**: *Haas 1519* (UCAC). **White Co.**: *Peck 98092* (BRIT).

ENGELMANN'S QUILLWORT – **Isoetes englemannii** A. Braun (Isoetaceae)—This species was discovered as new to Arkansas in Cleburne County by Don Culwell (Brown & Thomas 1992). It is now known from three counties in Arkansas.

Voucher specimen: **ARKANSAS. Cleburne Co.**: *Culwell 5925* (UCAC) . **Pike Co.**: *Peck 97346* (BRIT). **Van Buren Co.**: *Crank 94010* (HEND).

BLACKFOOTED QUILLWORT – **Isoetes melanopoda** Gay & Dur. (Isoetaceae)—With these 18 county vouchers, this species is now known from all 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Chicot Co.**: *Thomas 164609* (NLU). **Columbia Co.**: *Peck 97633* (BRIT). **Crawford Co.**: *Peck 2010079* (BRIT). **Desha Co.**: *Peck 98488* (BRIT). **Hempstead Co.**: *Peck 97649* (BRIT). **Howard Co.**: *Peck 97654* (BRIT). **Jackson Co.**: *Peck 2010021* (BRIT). **Lafayette Co.**: *Peck 97663* (BRIT). **Lawrence Co.**: *Peck 2010007* (BRIT). **Lincoln Co.**: *Peck 98483* (BRIT). **Little River Co.**: *Peck 97671* (BRIT). **Miller Co.**: *Peck 97679* (BRIT). **Nevada Co.**: *Peck 97683* (BRIT). **Prairie Co.**: *Peck 2010039* (BRIT). **Randolph Co.**: *Peck 2010009* (BRIT). **Scott Co.**: *Peck 2010066* (BRIT). **Sebastian Co.**: *Peck 2010075* (BRIT). **Sevier Co.**: *Sundell 14237* (UAM). **Woodruff Co.**: *Peck 2010025* (BRIT).

FOXTAIL BOG CLUBMOSS – **Lycopodiella alopecuroides** (L.) Cranfill (Lycopodiaceae)—This species was located for the first time in Arkansas by the author in 1985 on the Gulf Coastal Plain in Calhoun Co. (Peck & Peck 1988). It is now known from 15 counties in Arkansas, mainly on the Gulf Coastal Plain Region.

Voucher specimens: **ARKANSAS. Calhoun Co.**: *Peck 86164* **(BRIT). Cleveland Co.**: *Peck 96545* (BRIT). **Columbia Co.**: *Peck 98548* (BRIT). **Dallas Co.**: *Marsh 8498* (HEND). **Grant Co.**: *Peck 96561* (BRIT). **Hempstead Co.**: *Peck 98699* (BRIT). **Hot Spring Co.**: *Bray 117* (HEND). **Lafayette Co.**: *Peck 98664* (BRIT). **Little River Co.**: *Peck 98669* (BRIT). **Miller Co.**: *Peck 98676* (BRIT). **Nevada Co.**: *Marsh 8455* (HEND). **Ouachita Co.**: *Peck 98683* (BRIT). **Pulaski Co.**: *Murray sn* (BRIT). Saline Co.: Bray 122 HEND). Union Co.: Peck 94513 (BRIT).

APPRESSED BOG CLUBMOSS – **Lycopodiella appressum** (Chapman) Lloyd and Underwood (Lycopodiaceae)—This species was first collected in Arkansas by Flora A. Haas from Saline Co. in 1931. With these additional vouchers, the species is now known from 21 counties in Arkansas. The species is known from one locality in the Ouachita Mountain Region from an old field developed in a wet portion of a quarry, while the other 20 counties lie on the Gulf Coastal Plain Region of Arkansas.

Voucher specimens: **ARKANSAS. Cleveland Co.**: *Peck 96544* (BRIT). **Dallas Co.**: *Peck 96548* (BRIT). **Grant Co.**: *Peck 96560* (BRIT). **Howard Co.**: *Peck 98664* (BRIT). **Jefferson Co.**: *Walker 1107962* (UARK). **Little River Co.**: *Peck 98668* (BRIT). **Miller Co.**: *Logan 126* (HEND). **Pike Co.**: *Marsh 8504* (HEND). **Pulaski Co.**: *Witsell sn* (BRIT). **Sevier Co.**: *Peck 98682* (BRIT).

FEATHERSTEM BOG CLUBMOSS – **Lycopodiella prostrata** (Harper) Cranfill (Lycopodiaceae)—In Arkansas, this is the rarest of the three species of Bog Clubmosses, being discovered in Arkansas for the first time by the author in 1985 (Peck & Peck 1988). The species is now known from seven counties in the Arkansas Gulf Coastal Plain Region.

Voucher specimens: **ARKANSAS. Calhoun Co.**: *Peck 86319* (BRIT). **Clark Co.**: *Bray 205* (HEND). **Garland Co.**: *Marsh 8493* (HEND). **Hot Spring Co.**: *Marsh 8192* (HEND). **Nevada Co.**: *Marsh 8486* (HEND). **Pike Co.**: *Marsh 8840* (HEND). Saline Co.: Bray 120 (HEND).

BRUCE'S HYBRID CLUBMOSS – **Lycopodiella ×bruceii** Cranfill (Lycopodiaceae) [*L. appressa* × *prostrata*]—This hybrid was first discovered in Arkansas in Calhoun Co. by the author in 1985 (Peck & Peck 1988). The hybrid is now known from 8 counties on the Arkansas Gulf Coastal Plain Region.

Voucher specimens: **ARKANSAS. Calhoun Co.**: *Peck 86241* (BRIT). **Clark Co.**: *Bray 209* (HEND). **Garland Co.**: *Marsh 8494* (HEND). **Hot Spring Co.**: *Marsh 8484* (HEND). **Nevada Co.**: *Marsh 8487* (HEND). **Pike Co.**: *Marsh 8844* (HEND). **Saline Co.**: *Bray sn* (HEND). **Union Co.**: *Peck 94514* (BRIT).

COPELAND'S HYBRID CLUBMOSS – **Lycopodiella ×copelandii** (Eiger) Cranfill (Lycopodiaceae) [*L. alopecuroides* × *appressa*]—This hybrid was first discovered in Arkansas by Steve Orzell in 1985 from Calhoun Co. (Peck & Peck 1988). It is now known from 8 counties in the Gulf Coastal Plain Region of southern Arkansas.

Voucher specimens: **ARKANSAS. Calhoun Co.**: *Peck 86271* (BRIT). **Clark Co.**: *Bray 189* (HEND). **Dallas Co.**: *Marsh 8499* (HEND). **Nevada Co.**: *Marsh 8464* (HEND). **Pike Co.**: *Marsh 8843* (HEND). **Pulaski Co.**: *Peck 98001* (BRIT). **Saline Co.**: *Bray sn* (HEND). **Union Co.**: *Bray 199* (HEND).

GOLDEN WATERCLOVER – **Marsilea macropoda** Engelm. ex A. Braun in Kunze (Marsileaceae)—Once considered an endemic restricted to south-central Texas, this species was next located in an abandoned lot in New Orleans, Louisiana, in 1982 (Landry & Holder 1985). Jacono and Johnson (2006) also reported it from Alabama and Florida. It was brought into the water garden trade and made available across the southeastern USA (Hoshizaki & Moran 2001; Mickel 2003). In 2004 populations of this species were discovered in disturbed lowland hardwood swamps in southwestern Arkansas, adjacent to Texas. In 2010 a small population was located at the edge of Pleasant Lake, Little River Co., and at Oak Lake in nearby Miller Co. The populations were not near human habitation and their occurrence seemed natural. These outlier populations were potentially dispersed to these stations by waterfowl or less likely transported accidentally on aquatic watercraft.

Voucher specimens: **ARKANSAS. Little River Co.**: *Peck 2010106* (BRIT). **Miller Co.**: *Peck 2010105* (BRIT).

HAIRY WATERCLOVER – **Marsilea vestita** Hook. and Grev. (Marsileaceae)—First collected in Arkansas by Nuttall in 1819. George Englemann collected it along the Arkansas River in 1832 in the vicinity of Little Rock, where Witsell and Shepherd re-collected it in 1997 (Witsell & Shepherd 1999). Jacono and Johnson (2006) discussed the systematic of this species across the southeastern USA. With these records, the species is known from 18 Arkansas counties.

Voucher specimens: **ARKANSAS. Conway Co.**: *Peck 2010095* (BRIT). **Franklin Co.**: *Peck 2010096* (BRIT). **Jefferson Co.**: *Peck 98544, 2010104* (BRIT). **Johnson Co.**: *Peck 2010124* (BRIT). **Lincoln Co.**: *Sundell 15014* (UAM). **Logan Co.**: *Peck 2010097* (BRIT). **Perry Co.**: *Peck 2010103* (BRIT). **Pope Co.**: *Peck 2010098* (BRIT). **Pulaski Co.**: *Peck 2010102* (BRIT). **Sebastian Co.**: *Witsell 030829* (ANHC). **Yell Co.**: *Culwell sn* (UCAC).

BULBOUS ADDER'S-TONGUE FERN – **Ophioglossum crotalophoroides** Walt. (Ophioglossaceae)—First collected in Arkansas by Dwight Moore in 1945 in Nevada Co. Thomas (1978) reported it from 27 counties in Arkansas. It is now known from 47 counties, being collected mainly in bare spots in turf at rural cemeteries with minimal perpetual care.

Voucher specimens: **ARKANSAS. Arkansas Co.**: *Peck 98022* (BRIT). **Chicot Co.**: *Peck 99018* (BRIT). **Desha Co.**: *Peck 99012* (BRIT). **Lawrence Co.**: *Peck 96013* (BRIT). **Lonoke Co.**: *Peck 97005* (BRIT). **Monroe Co.**: *Peck 97031* (BRIT). **Scott Co.**: *Marsh 9706* (HEND). **Sharp Co.**: *Peck 96008* (BRIT). **Woodruff Co.**: *Peck 96019* (BRIT). **Yell Co.**: *Marsh 8621* (HEND).

LIMESTONE ADDER'S-TONGUE FERN – **Ophioglossum engelmannii** Prantl (Ophioglossaceae)—With these 4 vouchers, this species is now known from 33 counties in Arkansas.

Voucher specimens: **ARKANSAS. Jefferson Co.**: *Logan 109* (UCAC). **Lafayette Co.**: *Golden 101* (HEND). **Logan Co.**: *Peck 86117* (BRIT). **Saline Co.**: *Witsell 020162* (BRIT).

LEAST ADDER'S-TONGUE FERN – **Ophioglossum nudicaule** L. f. (Ophioglossaceae)—Discovered for the first time in Arkansas by R. Dale Thomas from Ashley Co. in 1972 (Thomas 1978). This species is now known from 22 counties in Arkansas mainly on the Gulf Coastal Plain Region.

Voucher specimens: **ARKANSAS. Arkansas Co.**: *Thomas 27299* (UARK). **Dallas Co.**: *Marsh 9617* (HEND). **Desha Co.**: *Marsh 9178* (HEND). **Grant Co.**: *Peck 99057* (BRIT). **Lafayette Co.**: *Golden 103* (HEND). **Miller Co.**: *Golden 107* (HEND). **Montgomery Co.**: *Cornell 170* (HEND). **Pike Co.**: *Golden 90* (HEND). **Sevier Co.**: *Golden 22* (HEND).

SOUTHERN ADDER'S-TONGUE FERN – **Ophioglossum pycnostichum** (Fernald) A. Löve & Löve (Ophioglossaceae)—With these 8 additional vouchers, this species is now known to occur in 37 counties in Arkansas.

Voucher specimens: **ARKANSAS. Boone Co.**: *Witsell 05333* (ANHC). **Cleveland Co.**: *Witsell 05045* (ANHC). **Crawford Co.**: *Dale sn* (UARK). **Lonoke Co.**: *Witsell 020112* (ANHC). **Pope Co.**: *Kirshberger 005* (UAM). **Saline Co.**: *Witsell 06048* (ANHC). **St. Francis Co.**: *Ambrose 17* (STAR). **Van Buren Co.**: *Witsell 05244* (BRIT).

CINNAMON FERN – **Osmunda cinnamomea** L. var. **cinnamomea** (Osmundaceae)—With these 13 additional vouchers, this species is now known from all 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Hyatt 5640* (BRIT). **Boone Co.**: *Peck 98593* (BRIT). **Carroll Co.**: *Peck 98645* (BRIT). **Craighead Co.**: *Peck 2010016* (BRIT). **Crittenden Co.**: *Peck 2010034* (BRIT). **Fulton Co.**: *Peck 97585* (BRIT). **Johnson Co.**: *Johnson 5273* (APCR). **Lee Co.**: *Peck 97605* (BRIT). **Marion Co.**: *Peck 98080* (BRIT). **Mississippi Co.**: *Peck 2010016* (BRIT). **Philips Co.**: *Peck 98081* (BRIT). **Searcy Co.**: *Peck 99618* (BRIT). **Washington Co.**: *Peck 98612* (BRIT).

ROYAL FERN – **Osmunda regalis** L. var **spectabilis** (Willd.) Gray (Osmundaceae)—With these 13 additional vouchers, this species is now known from all 75 Arkansas counties.

Voucher specimens: **ARKANSAS. Boone Co.**: *Peck 98594* (BRIT). **Carroll Co.**: *Peck 98641* (BRIT). **Conway Co.**: *Culwell 4437* (UCAC). **Crittenden Co.**: *Peck 2010035* (BRIT). **Cross Co.**: *Peck 2010031* (BRIT). **Izard Co.**: *Peck 97581* (BRIT). **Lee Co.**: *Peck 97604* (BRIT). **Marion Co.**: *Peck 98079* (BRIT). **Mississippi Co.**: *Peck 2010017* (BRIT). **Phillips Co.**: *Peck 98691* (BRIT). **Randolph Co.**: *Peck 99544* (BRIT). **St. Francis Co.**: *Peck 2010036* (BRIT). **Searcy Co.**: *Peck 99617* (BRIT).

NODDING CLUBMOSS – **Palhinhaea cernuua** (L.) Vasconcellos & Franko (Lycopodiaceae)—This species was discovered for the first time in Arkansas by Jimbo Bray on 14 Oct 1995 in a barrow pit near Bluff City, Nevada Co. (Bray 1996). On 21 Oct 1995 it was inspected by Bray, Dan Marsh, Don Crank, and James Peck. At this time a small side stem was selected and carefully removed by Bray as a physical voucher. The station was revisited 14 Nov 1995 by Peck and W.H.Wagner, Jr., who noticed it was browning and becoming senescent. The plant persisted for three years at this location, but with failing vigor and thriftiness until it was no longer evident by 1997. No other plants of this species were seen at that time or in subsequent visits to the location.

Voucher specimen: **ARKANSAS. Nevada Co.**: *Bray 269* (HEND).

PURPLE-STEMMED CLIFF BRAKE – **Pellaea atropurpurea** (L.) Link (Pteridaceae)—With these two vouchers, the species is extended further to the northeast in Arkansas. This species is now known from 37 counties in the Ouachita and Ozark regions in Arkansas.

Voucher specimens: **ARKANSAS. Lawrence Co.**: *McNalley 665* (STAR). **Randolph Co.**: *Taylor 2092* (UARK).

SMOOTH CLIFF BRAKE – **Pellaea glabella** Mett. ex Kuhn subsp. **glabella** (Pteridaceae)—First reported from Arkansas by Buchholz and Palmer (1926). With this one addition the species is now known from 15 counties in Arkansas.

Voucher specimen: **ARKANSAS. Madison Co.**: *McWilliams 64* (UCAC).

SOUTHERN BEECH FERN – **Phegopteris hexagonopteris** (Michx.) Fee (Thelypteridaceae)—With these 10 vouchers, this species is now documented from all 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Chicot Co.**: *Peck 96278* (BRIT). **Clay Co.**: *Peck 97401* (BRIT). **Crittenden Co.**: *Peck 97374* (BRIT). **Desha Co.**: *Peck 96283* (BRIT). **Greene Co.**: *Peck 97391* (BRIT). **Jackson Co.**: *Peck 97382* (BRIT). **Mississippi Co.**: *Peck 97368* (BRIT). **Monroe Co.**: *Peck 97364* (BRIT). **Prairie Co.**: *Peck 99046* (BRIT). **Woodruff Co.**: *Peck 97371* (BRIT).

AMERICAN PILLWORT – **Pilularia americana** A. Br. (Marsileaceae)—First collected in North America by Nuttall (1835) from Fort Smith, Sebastian Co., Arkansas. With these five vouchers, the species is now known from 13 counties in west-central Arkansas, mainly from autumn collections following draw downs that exposed shoreline mudflats (Culwell 1994).

Voucher specimens: **ARKANSAS. Hot Spring Co.**: *J. Moore s.n.* (UAM). **Marion Co.**: *Witsell 050347* (ANHC). **Pope Co.**: *Witsell 07641* (ANHC). **Saline Co.**: *Witsell 050886* (ANHC). **Yell Co.**: *Peck 2003240* (BRIT).

COMMON POLYPODY -- **Polypodium virginianum** L. (Polypodiaceae)—With these two vouchers, this species is known from 23 counties in Arkansas in the Ouachita and Ozark regions.

Voucher specimens: **ARKANSAS. Polk Co.**: *Crank sn* (UAM). **White Co.**: *Edens sn* (LYON).

SLENDER BOG CLUBMOSS – **Pseudolycopodiella caroliniana** (L.) Holub (Lycopodiaceae)—This species was first discovered in Arkansas by Steve Orzell in 1985 (Peck & Peck 1988). Arkansas populations occur in spongy wet microhabitats associated with corrizzo soils (Bray & Marsh 1993). The Arkansas populations are some of the most southwestern in the USA range of the species. With these vouchers, the species is now known from 8 counties in Arkansas.

Voucher specimens: **ARKANSAS. Bradley Co.**: *Witsell 04906* (ANHC). **Calhoun Co.**: *Peck 86134* (BRIT). **Clark Co.**: *Bray 197* (HEND). **Hot Spring Co.**: *Marsh 8461* (HEND). **Nevada Co.**: *Marsh 8461* (HEND). **Pike Co.**: *Marsh 8839* (HEND). **Saline Co.**: *Moran sn* (BRIT). **Union Co.**: *Peck 94512* (BRIT).

WHISK FERN – **Psilotum nudum** (L.) P. Beauv. (Psilotaceae)—This species was first discovered in Arkansas as an escape from cultivation in a yard in Arkadelphia, Clark Co. (Bray, Whitehead, Marsh, McMasters, & Crank 1994). The first natural population was discovered in Lafayette Co. by the author in 1994 (Peck 1995). Subsequently, it was collected across extreme southern Arkansas (Peck & Taylor 1995). The species is now known from 13 counties in Arkansas.

Voucher specimens: **ARKANSAS. Ashley Co.**: *Peck 97623* (BRIT). **Bradley Co.**: *Peck 97432* (BRIT). **Calhoun Co.**: *Peck 99734* (BRIT). **Clark Co.**: *McMasters 95001* (HEND). **Columbia Co.**: *Peck 98188* (BRIT). **Drew Co.**: *Peck 97436* (BRIT). **Hempstead Co.**: *Stuckey sn* (BRIT). **Lafayette Co.**: *Peck 94003* (BRIT). **Little River Co.**: *Peck 2000374* (BRIT). **Miller Co.**: *Peck 2000344* (BRIT). **Nevada Co.**: *Peck 99243* (BRIT). **Ouachita Co.**: *Peck 98499* (BRIT). **Union Co.**: *Amason sn* (BRIT).

NORTHERN BRACKEN FERN – **Pteridium aquilinum** (L.) Kuhn var. **latiusculum** (Desv.) Heller (Dennstaedtiaceae)—With these 11 vouchers, this variety of Bracken Fern is documented from all 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Benton Co.**: *Greene sn* (UMO). **Chicot Co.**: *Peck 2010046* (BRIT). **Crittenden Co.**: *Peck 2010032* (BRIT). **Cross Co.**: *Peck 2010029* (BRIT). **Desha Co.**: *Peck 2010043* (BRIT). **Lee Co.**: *Peck 98644* (BRIT). **Mississippi Co.**: *Peck 2010014* (BRIT). **Monroe Co.**: *Peck 96212* (BRIT). **Phillips Co.**: *Peck 98665* (BRIT). **Poinsett Co.**: *Peck 2010019* (BRIT). **St. Francis Co.**: *Peck 98677* (BRIT).

SOUTHERN BRACKEN FERN – **Pteridium aquilinum** (L.) Kuhn var. **pseudocaudatum** (Clute) Heller (Dennstaedtiaceae)—With these 21 vouchers, this variety of Bracken Fern is documented from all 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 98712* (BRIT). **Boone Co.**: *Peck 98569* (BRIT). **Carroll Co.**: *Peck 98645* (BRIT). **Chicot Co.**: *Peck 2010047* (BRIT). **Clay Co.**: *Peck 98620* (BRIT). **Craighead Co.**: *Peck 2010012* (BRIT). **Crittenden Co.**: *Peck 2010033* (BRIT). **Desha Co.**: *Peck 2010044* (BRIT). **Jackson Co.**: *Peck 2010022* (BRIT). **Lawrence Co.**: *Peck 98603* (BRIT). **Madison Co.**: *Peck 99588* (BRIT). **Mississippi Co.**: *Peck 2010015* (BRIT). **Monroe Co.**: *Peck 2010038* (BRIT). **Newton Co.**: *Peck 99551* (BRIT). **Philips Co.**: *Peck 97417* (BRIT). **Poinsett Co.**: *Peck 2010020* (BRIT). **Randolph Co.**: *Peck 98627* (BRIT). **St. Francis Co.**: *Peck 97425* (BRIT). **Searcy Co.**: *Peck 98557* (BRIT). **Sharp Co.**: *Peck 98590* (BRIT). **Woodruff Co.**: *Peck 2010026* (BRIT).

MEADOW SPIKEMOSS – **Selaginella apoda** (L.) Spring ex Mart. (Selaginellaceae)—This species is widespread across Arkansas associated with wetland, riparian, and semi-aquatic microhabitats from ditches to streams mainly in the Ouachita and Ozark regions. With these 19 vouchers the species is known from 56 of the 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 2010088* (BRIT). **Benton Co.**: *Peck 2010085* (BRIT). **Boone Co.**: *Peck 2010087* (BRIT). **Carroll Co.**: *Peck 2010086* (BRIT). **Conway Co.**: *Peck 2010094* (BRIT). **Franklin Co.**: *Peck 2010091* (BRIT). **Independence Co.**: *Peck 97610* (BRIT). **Izard Co.**: *Peck 97589* (BRIT). **Johnson Co.**: *Peck 2010092* (BRIT). **Lawrence Co.**: *Peck 97613* (BRIT). **Marion Co.**: *Johnson 414* (HXC). **Newton Co.**: *Peck 2010089* (BRIT). **Randolph Co.**: *Peck 97589* (BRIT). **Searcy Co.**: *Peck 2010090* (BRIT). **Sebastian Co.**: *Peck 201093* (BRIT). **Sharp Co.**: *Peck 97613* (BRIT). **Stone Co.**: *Peck 97591* (BRIT). **Van Buren Co.**: *Peck 97614* (BRIT). **White Co.**: *Speer 207* (HARD).

ECLIPSED MEADOW SPIKEMOSS – **Selaginella eclipes** Buck (Selaginellaceae)—This species was named in 1977 by William Buck who separated it from *S. apoda*. The ranges of these species overlap in Arkansas. The microhabitats are similar as well, but the species different in leaf morphology and megaspore surface features. With these seven vouchers, this species is now known from 35 counties in Arkansas mainly in the Ouachita and Ozark regions.

Voucher specimens: **ARKANSAS. Conway Co.**: *Peck 2010071* (BRIT). **Johnson Co.**: *Peck 2010073* (BRIT). **Pope Co.**: *Golden 25* (HEND). **Pulaski Co.**: *Peck 2010001* (BRIT). **Scott Co.**: *Peck 20100068* (BRIT). **Sebastian Co.**: *Peck 2010083* (BRIT). **Yell Co.**: *Peck 2010069* (BRIT).

RIDDELL'S SPIKEMOSS – **Selaginella arenicola** Underwood subsp. **riddellii** (van Eselt.) R. Tryon (Selaginellaceae)—The North American range of this species is divided into two parts on either side of the Mississippi River with the eastern portion in Alabama, Florida, and Georgia and the western portion in Arkansas, Louisiana, Oklahoma, and Texas. When treated as separate species, the eastern

portion is named *S. arenicola* and the western portion is known as *Selaginella riddellii.* This spikemoss of dry, sandy soils was first discovered in Arkansas in 1967 by Gary Tucker (1971) and until recently occurred in 4 counties north of the Arkansas River and in 5 counties south of the Arkansas River. Field work has added one more county north of the Arkansas River in central Arkansas in sandy prairie on Arkansas River terraces in Pulaski County and two more counties in southwestern Arkansas along the Red River in Little River County and near Upper Red Lake in Hempstead Co. This species now is known from 12 Arkansas counties.

Voucher specimens: **ARKANSAS. Hempstead Co.**: *Peck 2009592* (BRIT). **Little River Co.**: *Peck 2009584* (BRIT). **Pulaski Co.**: *Peck 2009544* (BRIT).

ROCK SPIKEMOSS – **Selaginella rupestris** (L.) Spring (Selaginellaceae)—With these two vouchers this species is now known from 18 counties in Arkansas.

Voucher specimens: **ARKANSAS. Madison Co.**: *Wages sn* (UCAC). **Pulaski Co.**: *Peck 2009545* (BRIT).

NEW YORK FERN – **Thelypteris novaboracensis** (L.) Nieuwl. (Thelypteridaceae)—This species is common in its core or metropolis area in northeastern North America, but is considered rare in the Ozark and Ouachita regions of Arkansas where it is a western disjunct from the species's core range. With these additional vouchers this species is now known from 13 counties in Arkansas with six counties in the Ozark Region and seven counties in the Ouachita Region.

Voucher specimens: **ARKANSAS: Baxter Co.**: *Peck 99400* (BRIT). **Stone Co.**: *Peck 99391* (BRIT). **Van Buren Co.**: *Hendrix sn* (BRIT).

MARSH FERN – **Thelypteris palustris** Schott. (Thelypteridaceae)—This fern occurs across southern Arkansas in roadside seeps and in open marshes in northeastern Arkansas. Peck and Taylor (1995) reported this species in 13 counties, to which another 20 are added here.

Voucher specimens: **ARKANSAS. Arkansas Co.**: *Peck 2010040* (BRIT). **Clark Co.**: *Peck 2010064* (BRIT). **Cleveland Co.**: *Peck 2010050* (BRIT). **Columbia Co.**: *Peck 2010053* (BRIT). **Cross Co.**: *Witsell 05290.5* (ANHC). **Dallas Co.**: *Peck 2010051* (BRIT). **Hot Spring Co.**: *Peck 1986212* (BRIT). **Howard Co.**: *Peck 2010059* (BRIT). **Jackson Co.**: *Peck 2010024* (BRIT). **Jefferson Co.**: *Peck 2010043* (BRIT). *Lafayette* **Co.**: *Witsell 07587* (ANHC). **Lincoln Co.**: *Peck 2010042* (BRIT). **Miller Co.**: *Peck 2010055* (BRIT). **Nevada Co.**: *Peck 2010054* (BRIT). **Ouachita Co.**: *Peck 2010052* (BRIT). **Pike Co.**: *Peck 2010061* (BRIT). **Pulaski Co.**: *Peck 2010003* (BRIT). **Sevier Co.**: *Peck 2010057* (BRIT). **Union Co.**: *Sundell 7459* (BRIT). **Woodruff Co.**: *Peck 2010027* (BRIT).

WEFT FERN – **Trichomanes intracatum** Farrar (Hymenophyllaceae)—Four "tropical" fern genera form independent gametophyte colonies in the southeastern USA — *Grammitis*, *Hymenophyllum*, *Vittaria*, and *Trichomanes* (Farrar 1967). The colonies expand through vegetative growth of prothalli as extended filaments or ribbons and produce vegetative dispersal bodies called gemmae that may also play a role in sexual reproduction. Old colony prothalli are female and produce a sex hormone antheridogen that promotes maleness in young, gemma produced plants (Emigh & Farrar 1977). These "sporophyte-less" ferns are "old" endemic, disjunct species (Farrar 1990) that have persisted until the present time only as the gametophyte generation. They occur in deep canyons in stations called rock

houses, cliff-terrain sheltered habitats with moderated microclimates that provide "tropical" environments (Billings & Anderson 1966; Farrar 1998) with plant species that have persisted, an environmental inertia (Cole 1985), through major climatic changes in the surrounding uplands (Cole 1985; Farrar 1998). Farrar (1992) named the independent *Trichomanes* gametophyte *T. intricatum*. All populations were reported from states east of the Mississippi River, as far north as Vermont.

The genus *Trichomanes* is represented in Arkansas by *Trichomanes boshianum* Sturm ex Bosch. and *T. petersii* A. Gray. Independent *Trichomanes* gametophyte colonies occur without either sporophyte both in the Ozark and Ouachita regions in Arkansas. The gametophytes of the two species with sporophytes have gametophyte morphology similar to that of *T. intracatum* (Farrar 1992). Yet they are all quite distinct genetically as shown by enzyme electrophoresis, with *T. intracatum* sharing only 1 of 13 bands with *T. boschianum* and one of 18 bands with *T. petersii* (Farrar 1985). Although no samples from Arkansas were determined to be *T. intracatum*, it seems odd that the species could have persisted in the southeastern USA or have migrated (vacillated north then south in rhythm with glacial minima and maxima in the eastern USA during the Pleistocene, and during the present glacial minima have dispersed northward onto glaciated landscapes as far north as Massachusetts and Vermont (Farrar, Parks, & McAlpin 1963; McAlpin & Farrar 1978; Parks 1989) without having become established in the Ozarks, Ouachitas, or Tunica Hills west of the Mississippi River. The gametophyte specimen cited seems to be a bit different than those from populations with sporophytes, and is offered as a putative voucher.

Voucher specimen: ARKANSAS: **Stone Co.**: *Peck 2008380* (BRIT).

APPALACHIAN BRISTLE FERN – **Trichomanes boschianum** Sturm ex Bosch. (Hymenophyllaceae)—This spectacular filmy fern was first located in Arkansas by Delzie Demaree on 20 August 1961 at Cleburne Co. (Wagner 1962); a second station in Madison County was located by Maxine Clark on 4 February 1962 (Clark 1962). Since then two more stations were located in two additional counties. A fifth county is reported here. The Arkansas populations are disjunct from the metropolis or core range in the southern Appalachian Mountains, with the closet eastern population being in extreme northeast Mississippi (Menapace, Davison, & Webb 1998). This species is now known from five counties in Arkansas.

Voucher specimens: **ARKANSAS: Cleburne Co.**: *Peck 2009875* (BRIT). **Johnson Co.**: *Turnipseed 219* (APCR). **Madison Co.**: *Clark 1400* (MO). **Newton Co.**: *Bonar sn* (APCR). **Pope Co.**: *Peck 2009867* (BRIT).

PETER'S BRISTLE FERN – **Trichomanes petersii** A. Gray (Hymenophyllaceae)—This interesting filmy fern is often found only with the aid of a flashlight, as it favors growing in dark microhabitats beneath rock ledges and often most vigorously where extra-illumination is required (Moran 1998). The first Arkansas discovery of this fern was made in May of 1967 (Farrar & Redfearn (1968) in Pope County. Peck (1985) reported the first discovery of a natural population of this species on a man-made surface (mine drift entrance wall) in western Garland Co. Allen (1975) reported that in lieu of rock outcrops to the south in Louisiana the fern was growing on the wet dark bases of Magnolia and American beech trees. Bray (1996) reported that populations in southern Arkansas tended to be on bases of trees, then switch to novaculite rocks northward in the Ouachita Region, and to hard sandstones in the Ozark Region in northern Arkansas. The species had been located in 9 counties in Arkansas. While inspecting specimens at the herbarium of University of Arkansas at Fayetteville (UARK), it was noticed that the folder with Arkansas specimens of this species was empty. Thus, I am citing new

specimens to replace those 9 counties for which their vouchers were missing and 4 additional counties. This species is now known from 13 counties in Arkansas.

Voucher specimens: **ARKANSAS. Cleburne Co.**: *Peck 2009877* (BRIT). **Clarke Co.**: *Peck 2009885, 2009913* (BRIT). **Conway Co.**: *Peck 2009870* (BRIT). **Garland Co.**: *Peck 2009873* (BRIT). **Hot Spring Co.**: *Peck 2009889* (BRIT). **Johnson Co.**: *Peck 2009867* (BRIT). **Montgomery Co.**: *Peck 2009877* (BRIT). **Newton Co.**: *Peck 2009865* (BRIT). **Pike Co.**: *Peck 2009883, 2009903* (BRIT). **Pope Co.**: *Peck 2009868* (BRIT). **Saline Co.**: *Peck 2009918* (BRIT). **Stone Co.**: *Peck 2009870* (BRIT). **Van Buren Co.**: *Peck 2009137* (BRIT).

EASTERN BLUNT-LOBED CLIFF FERN – **Woodsia obtusa** (Spreng.) Torr. var. **obtusa** (Dryopteridaceae)—With these nine vouchers, this variety is now documented from all 75 counties in Arkansas.

Voucher specimens: **ARKANSAS. Chicot Co.**: *Peck 97426* (BRIT). **Craighead Co.**: *Peck 98601* (BRIT). **Crittenden Co.**: *Peck 99212* (BRIT). **Desha Co.**: *Peck 97442* (BRIT). **Jackson Co.**: *Peck 200211* (BRIT). **Mississippi Co.**: *Peck 99230* (BRIT). **Monroe Co.**: *Peck 200234* (BRIT). **Poinsett Co.**: *Peck 98624* (BRIT). **Woodruff Co.**: *Peck 200227* (BRIT).

WESTERN BLUNT-LOBED CLIFF FERN – **Woodsia obtusa** (Spreng.) Torr. var. **occidentalis** Windham (Dryopteridaceae)—With these 13 vouchers, the variety is now known from 43 counties in Arkansas mainly in the Ouachita and Ozark regions.

Voucher specimens: **ARKANSAS. Benton Co.**: *Peck 96544* (BRIT). **Clay Co.**: *Richards 5274* (STAR). **Greene Co.**: *Richards 5491* (STAR). **Howard Co.**: *Peck 96748* (BRIT). **Little River Co.**: *Peck 96714* (BRIT). **Madison Co.**: *Peck 98478* (BRIT). **Pulaski Co.**: *Witsell 01-0223* (ANHC). **Randolph Co.**: *Peck 97512* (BRIT). **Saline Co.**: *Witsell 06139* (ANHC). **Scott Co.**: *Peck 99312* (BRIT). **Sebastian Co.**: *Peck 2000206* (BRIT). **Sevier Co.**: *Peck 96731* (BRIT). **Sharp Co.**: *Richards 5995* (STAR).

APPALACHIAN MOUNTAIN WOODSIA – **Woodsia scopulina** D.C. Eaton subsp. **appalachiana** (T.M.C. Taylor) Windham (Dryopteridaceae)—This most isolated disjunct fern from the eastern USA was first discovered in Arkansas by E. J. Palmer (1924) at the top of Mt. Magazine in Logan Co. Since then it was discovered by Don Crank in 1996 from the eastern end of Ouachita Region in Perry Co. and in 2002 by Sara Nunn from Polk Co. in the western end of the Arkansas Ouachita Region. This species is now known from three counties in Arkansas.

Voucher specimens: **ARKANSAS. Logan Co.**: *Taylor 1045* (SIU). **Perry Co.**: *Peck 95006* (BRIT). **Polk Co.**: *Nunn 5321* (UARK).

NET-VEINED CHAIN FERN – **Woodwardia areolata** (L.) Moore (Blechnaceae)—With these 11 vouchers, this species is now known from 74 of the 75 counties of Arkansas, with only Benton Co. lacking a documented voucher.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 96704* (BRIT). **Boone Co.**: *Peck 97340* (BRIT). **Carroll Co.**: *Peck 98214* (BRIT). **Clay Co.**: *Peck 97632* (BRIT). **Fulton** Co.: *Peck 96722* (BRIT). **Lawrence Co.**: *Peck 97681* (BRIT). **Marion Co.**: *Peck 99118* (BRIT). **Newton Co.**: *Witsell 99050* (ANHC). **Randolph Co.**: *Peck 98618* (BRIT). **Searcy Co.**: *Peck 97512* (BRIT). **Sharp Co.**: *Peck 96691* (BRIT). **Washington Co.**: *Peck 99111* (BRIT).

## NATURALIZED SPECIES

SIMPLER EAST INDIAN HOLLY FERN – **Arachnioides simplicior** (Makino) Ohwi 'Variegata' (Dryopteridaceae)—Gordon (1981) reported *Arachnioides simplicior* new and naturalized to South Carolina and the USA. The species is tolerant of summer heat and drought in its native India, where it was brought into cultivation, making it an excellent hardy fern (Hoshizaki & Moran 2001; Mickel 2003) for propagation westward across the Gulf States to Texas. Escapes from cultivation were discovered in 2008 at Alsopp Park in Little Rock and at Garvan Woodland Gardens in Hot Springs. The former site seems truly adventive while the latter is an escape from formal planting. Larger fronds are variegated, but the anemic color pattern is reduced in juvenile fronds and after heat drying. The plants have persisted for 3 years. They are locally available at nurseries in Arkansas and available across the South. The slow growth of this non-native at these sites suggests that they are neither aggressive nor invasive. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010125* (BRIT). **Pulaski Co.** *Peck 20100126* (BRIT).

JAPANESE PAINTED LADY FERN – **Athyrium niponicum** (Mett.) Hance 'Pictum' (Dryopteridaceae)—This non-native fern is readily available at plant nurseries and commonly cultivated across the eastern USA (Mickel 2003; Hoshizaki & Moran 2001). The fern is native to Japan where it was brought into cultivation. Although putatively sterile, plants were found some distance from formal plantings in central Arkansas. Escaped populations, one each in Hot Springs and Little Rock, were found in local wooded ravines in city greenbelts. The species is certainly not aggressive or invasive. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010000* (BRIT). **Pulaski Co.**: *Peck 2010112* (BRIT).

FALCATE HOLLY FERN – **Cyrtomium falcatum** (L. f.) C. Presl (Dryopteridaceae)—This non-native fern is commonly available and widely planted across the southeastern USA (Hoshizaki & Moran 2001; Mickel 2003). All of the material cultivated in the USA was brought into cultivation in Japan (Oka 2008). In 2002 this species was first discovered as an escape from cultivation in Arkansas at Boyle Park, Little Rock, Pulaski Co., and subsequent to that it was found in greenbelt woods at Pine Bluff, Jefferson Co. Both are escapes from cultivation to urban greenbelt parks or woods with plantings or nurseries noted within 2 km of the plants (Peck 2003). A third station was recently discovered in Garvan Woodland Garden, Hot Springs, Garland Co. Escaped and adventive plants were noted with the ravine woods in areas that were not planted with ferns. These plants may have started from spores from the cultivated plants in the garden. At all stations in Arkansas the plants are slow growing, and thus this is not an aggressive or invasive species in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010237* (BRIT). **Jefferson Co.**: *Peck 2010237* (BRIT). **Pulaski Co.**: *Peck 2002744* (BRIT).

FORTUNE'S HOLLY FERN – **Cyrtomium fortunei** J. Smith var. **fortunei** (Dryopteridaceae)—This non-native cultivated fern is readily available in the southeastern USA hardy fern trade (Hoshizaki & Moran 2001; Mickel 2003). As all of our cultivated *Cyrtomium* in the USA are from Japan from the Kanto region, the key provided by Oka (2008) adds to our ability to identify cultivated and escaped materials. This fern was first noted in 1973 as growing adventively on old brick walls in Charleston,

South Carolina, and reported for the first time in North America by John M. McDougal (1976). Landry, Israel, Schwarzwalder, and Thomas (1979) reported escaped plants found in the Tunica Hills of Louisiana and collected by R. Dale Thomas in 1974 and in Lousiana and Mississippi in 1978 and 1979 by M. Isreal, G. Landry and R. Schwarzwalder. They thought that these stations might represent old escapes and local reproduction from plants from once numerous, old plantation gardens. In 1988, Wilson Baker showed me specimens for determination of *C. fortunei* from the batture lands of Desha County, Arkansas, in support of his field work conducted under contract to the Nature Conservancy of Arkansas. Such plants might also be escapes from cultivation around old plantations. The specimens were to be deposited at Tall Timbers Research Laboratory, outside Tallahassee, Florida (Peck 2003). After 20 years of asking to annotate the voucher specimens, in 2010 the collector has confirmed that the vouchers are not at that herbarium and their location is now unknown. Therefore, while the species may actually occur in Arkansas, new vouchers are required, and until the population is refound, must be considered deleted or removed from the documented flora of Arkansas.

AUTUMN FERN – **Dryopteris erythrosora** (D.C. Eaton) O. Kunze (Dryopteridaceae)—This non-native fern was brought into cultivation in Asia where it is native to China and Japan. It is commonly available and widely planted in the southeastern USA (Hoshizaki & Moran 2001; Mickel 2003). It was reported earlier as having escaped far from local cultivation in Arkansas (Simpson, Crank, Witsell, & Peck 2008) into timberland in Hot Spring Co. Since then it has been found as adventive or escaped plants in 6 more Arkansas counties. While readily spreading from spores, this species is not so aggressive that it warrants being called invasive but bears watching for additional adventive stations across southern Arkansas in timber lands. This species is naturalized in 7 counties in Arkansas.

Voucher specimens: **ARKANSAS. Columbia Co.**: *Peck 2011007* (BRIT). **Garland Co.**: *Peck 2008035* (BRIT). **Hot Spring Co.**: *Peck 20072041* (BRIT). **Little River Co.**: *Peck 2009101* (BRIT). **Pulaski Co.**: *Peck 2008011* (BRIT). **Ouachita Co.**: *Peck 2009073* (BRIT). **Union Co.**: *Peck 2010695* (BRIT).

SMOOTH BRAMBLE FERN – **Hypolepis tenuifolia** (G. Forster) Bernh. (Dennstaedtiaceae)—Although not well known (Brownsey 1983) in the southeastern fern garden trade, this non-native fern from Asia and the South Pacific can play an excellent role in larger spaces where a robust fern can roam. It is robust enough in form and expansion to be used sparingly. It is not as large, aggressive, or invasive as the related *Hypolepis reptans*, which has spinulose projections along the stipe and rachis (Mickel 2003; Hoshizaki & Moran 2001). In Arkansas *Macrothelypteris torresiana* has filled this role in mid-sized spaces, and is escaping regularly. *Hypolepis tenuifolia* was formally planted in four counties in garden settings and has escaped by spores to additional areas nearby. Nowhere is it too aggressive or invasive that it cannot be managed with mechanical or chemical methods. As this species becomes recognized for large gardens and used more regularly, it will escape readily across the southern one-half of the state and perhaps to the north of Little Rock. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Faulkner Co.**: *Peck 2010275* (BRIT). **Garland Co.**: *Peck 2010276* (BRIT). **Union Co.**: *Peck 19950102* (BRIT).

JAPANESE CLIMBING FERN – **Lygodium japonicum** (Thunb.) Sw. (Lygodiaceae)—This non-native fern was collected in Arkansas for the first time by Charles Meyer in 1981 from Ashley County (Taylor 1984). Since then other naturalized plants were discovered in the wild across the southern one-half of the state (Peck, Peacock, & Shepherd 1985; Sundell 1986). Urban escapes are known from 5 counties.

An earlier collection by R. Armstrong in Ft. Smith, Sebastian Co., in 1955 was an obvious escape from local cultivation. Other spontaneous escapes were found in 1983 by William Shepherd in Pulaski Co. with no known source plant in the neighborhood. At Calion in Union Co., Carl Amason tended numerous plants that grew upwards of 40 foot long vines (a single leaf) and were quite fertile, spreading many adventive juveniles throughout his property. Urban escapes are also known from Hot Springs (Garland Co.) and Malvern (Hot Spring County). Although an invasive species in Florida, Arkansas winters are usually sufficiently cold to thin the adult leaves or vines to one overwintering green leaf midrib from which regrowth occurs in the spring. This vine fern has provided a fire torch from ground fires into crown fires in timber lands in Florida, but it has not been documented in Arkansas. Peck and Taylor (1995) reported this fern from 14 Arkansas counties; now known from 25 counties in Arkansas.

Voucher specimens: **ARKANSAS. Clark Co.**: *Peck 2002033* (BRIT). **Cleveland Co.**: *Peck 2003133* (BRIT). **Dallas Co.**: *Peck 2002338*. **Garland Co.**: *Crank 93005* (HEND). **Grant Co.**: *Peck 2002144* (BRIT). **Hot Spring Co.**: *Gillaspy 80* (HEND). **Jefferson Co.**: *Peck 2002353* (BRIT). **Lincoln Co.**: *Peck 2010238* (BRIT). **Pike Co.**: *Peck 2003210* (BRIT). **Pulaski Co.**: *Peck 2003100* (BRIT). **Sebastian Co.**: *Armstrong sn* (UARK).

TORRES'S FERN – **Macrothelypteris torresiana** (Gaud.) Ching (Thelypteridaceae)—This is a widely available species in the hardy fern trade that is readily planted across the southeastern USA (Leonard 1972). Native to the Mariana Islands in the Pacific Ocean, this tropical species is now widespread around the world and common in Central America. It was reported for the first time in Arkansas beyond cultivation by Taylor and Johnson (1979). This non-native fern regularly escapes and is adventive as well and is now known across the southern half of Arkansas. It regularly shows up in disturbed dry sandy soils in timber farms or along county or timber access roads (Peck, Peacock, & Shepherd 1985). When given plenty of space it provides large arrays of fronds from rapidly growing rhizome colonies. It is faster growing and spreading than bracken but can be controlled readily by mechanical or chemical methods (Mickel 2003; Hoshizaki & Moran 2001). When this species becomes more established and recognized for its large garden potential, it is expected to escape and become established in counties to the north of Little Rock. Peck and Taylor (1995) reported this fern from 12 counties, to which another 14 are added.

Voucher specimens: **ARKANSAS. Arkansas Co.**: *Peck 1998327* (BRIT). **Calhoun Co.**: *Thomas 141528* (UAM). **Clark Co.**: *Peck 2010232* (BRIT). **Crittenden Co.**: *Roger 106* (BRIT). **Cross Co.**: *Witsell 051150* (ANHC). **Dallas Co.**: *Peck 1997567* (BRIT). **Desha Co.**: *van Horn sn* (UAM). **Garland Co.**: *Crank 95007* (HEND). **Grant Co.**: *Peck 2010230* (BRIT). **Hempstead Co.**: *Peck 1998448* (BRIT). **Hot Spring Co.**: *Crank 95006* (HEND). **Jefferson Co.**: *Peck 20100231* (BRIT). **Lee Co.**: *Peck 2010233* (BRIT). **Marion Co.**: *Witsell 07409* (BRIT). **Monroe Co.**: *Peck 1998414* (BRIT). **Nevada Co.**: *Peck 1999357* (BRIT). **Ouachita Co.**: *Peck 2000044* (BRIT). **Pulaski Co.**: *Peck 20100235* (BRIT). **Saline Co.**: *Carneal 119* (BRIT). **St. Francis Co.**: *Peck 2010234* (BRIT).

VARIEGATED WATERCLOVER – **Marsilea mutica** Mett. (Marsileaceae)—This non-native species is readily available and widely planted across the southeastern USA (Hoshizaki & Moran 2001; Mickel 2003). The species is native to Australia and new Caledonia. The variegated or white central portion of the "four-leaf clover-like" frond makes this an easy species to distinguish from other *Marsilea*. As an escape, it was reported first from Virginia (Knepper, Johnson, & Musselman 2002). By 2008, it was reported from Maryland (Redman 2008) and had been discovered in Alabama, Florida, Georgia,

Mississippi, South Carolina, and Oklahoma as well (Jacono & Johnson 2006). The two stations in Arkansas were located near Pine Bluff in 2004 and Little Rock in 2006. Both stations were disturbed lowland areas with dumping of compost and anthropogenic trash evident. The populations might have escaped from human cultivation or been the result of waterfowl dispersal, or both. The Arkansas populations were expected based on Oklahoma populations to the west and on numerous states eastward to Florida and then north to Maryland. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Jefferson Co.**: *Peck 2010101* (BRIT). **Pulaski Co.**: *Peck 20101100* (BRIT).

EUROPEAN WATERCLOVER – **Marsilea quadrifolia** L. (Marsileaceae)—This non-native species was introduced from Europe into Connecticut from where it escaped by 1860 (Johnson 1986) and has spread as far west as two counties in Iowa (Peck 1976) and three counties in Missouri (Johnson 1985). Jacono and Johnson (2006), Johnson (1993), and Henry (1983) all make a point that "*M. quadrifolia* has not extended south of Maryland, Kentucky or Missouri," appearing "restricted to the more humid range of the cold temperate North." The southwesternmost populations are now known from along the Arkansas River or impoundments or wetlands adjacent to that river. It was first discovered along the Little Maumelle River adjacent to the Arkansas River at Little Rock, Pulaski Co., in 2007 (Simpson, Crank, Witsell, & Peck 2008; Serviss & Peck 2008). It was discovered not far from the Arkansas River at Spring Lake in Yell Co. by Sara Nunn in 2009 and along the Arkansas River at Pine Bluff in 2010. It is very likely that waterfowl brought it to Arkansas from states to the north (Illinois, Iowa, or Missouri). Once here, waterfowl certainly could be dispersing it further up and down riparian habitats of the Arkansas River.

Voucher specimens: **ARKANSAS. Jefferson Co.**: *Peck 2010109* (BRIT). **Pulaski Co.**: *Peck 20071514* (BRIT). **Yell Co.**: *Peck 2010108* (BRIT).

**OSTRICH FERN** – **Matteuccia struthiopteris** (L.) Todaro var. **pensylvanica** (Willd.) C.V. Morton (Dryopteridaceae)—This species is the edible fern of northeastern North America. It was a popular plant to grow around mid-western farm houses and city homes, with wild populations reduced to supply the demand. It still remains a popular hardy fern for cultivation in the Midwest (Hoshizaki & Moran 2001; Mickel 2003). By searching for old homesteads, old field plots, and out-buildings and garden-patch farms across the upland counties of Arkansas, an effort was made to find evidence of fern cultivation for aesthetics or use as spring tonic was still evident. The most vigorous plants were on wooded north-facing slopes with springs or seeps that protected the plants from the heat and drought of upland conditions. The more exposed or less protected plants were marginal to declining or remnant plants that were less thrifty. All of these plants were likely brought by settlers to these stations from the east or north and replanted, and in some cases persisted as mute testimony to failed subsistence farms. No plants were found that could be called native to Arkansas. While the species is native to the USA, it presence in Arkansas must be judged as planted, persisting, or escaped from cultivation and naturalized.

Voucher specimens: **ARKANSAS. Baxter Co.**: *Peck 2009591* (BRIT). **Boone Co.**: *Peck 2009604* (BRIT). **Carroll Co.**: *Peck 2009598* (BRIT). **Cleburne Co.**: *Peck 2009610* (BRIT). **Fulton Co.**: *Peck 20100123* (BRIT). **Garland Co.**: *Peck 2009606* (BRIT). **Hot Spring Co.**: *Peck 2009608* (BRIT). *Izard Co.: Peck 2009592* (BRIT). **Lawrence Co.**: *Peck 2009596* (BRIT). **Logan Co.**: *Peck 2009605* (BRIT). **Madison Co.**: *Peck 2009573* (BRIT). **Marion Co.**: *Peck 2009603*

(BRIT). **Montgomery Co.**: *Peck 2009607* (BRIT). **Newton Co.**: *Peck 2009572* (BRIT). **Pope Co.**: *Peck 2009601* (BRIT). **Randolph Co.**: *Peck 2009595* (BRIT). **Searcy Co.**: *Peck 2009609* (BRIT). **Sharp Co.**: *Peck 2009594* (BRIT). **Stone Co.**: *Peck 2009593* (BRIT). **Van Buren Co.**: *Peck 2009597* (BRIT). **White Co.**: *Peck 2009690* (BRIT). **Yell Co.**: *Peck 2009599* (BRIT).

YANKEE FERN – **Nephrolepis exaltata** (L.) Schott. (Dryopteridaceae)—This species is native to southern Florida and has been reported as naturalized in Louisiana and Texas. This garden trade species in Arkansas (Peck 2002) was first reported as a naturalized plant found in a wet, lowland woods east of Pine Bluff, Jefferson Co., along the Arkansas River. The plant had 20 fronds but was not very thrifty, vigorous, or fertile. While known from the wild in only one Arkansas county, it is grown on porches and patios in all 75 counties in Arkansas. The origin of the plant could have been the result of spore long distance dispersal or from spring flooding and movement of plants from other locations. It is surprising that no other naturalized plants or populations are known from Arkansas. The species in Arkansas appears to have a low invasive potential but occurs aggressively in swamps in southern Florida, perched on stumps and downed trees, from which many cultivars have been selected for hanging baskets plants.

Voucher specimens: **ARKANSAS. Jefferson Co.**: *Peck 2001101, 2001388* (BRIT).

STALKED ADDER'S-TONGUE FERN – **Ophioglossum petiolatum** Hooker (Ophioglossaceae)—R. Dale Thomas first collected this fern in Arkansas in 1972 at a Union Co. cemetery and subsequently in Dallas Co. in 1972, White Co. in 1973 and Jefferson Co. in 1975 (Thomas 1978). The species was collected as far north as southeastern Missouri (Thomas, Marx, use Lawson 1974). Bray, Whitehead, Marsh, McMasters, and Crank (1994) added Clark Co. The species is commonly located in old, rural cemeteries, particularly beneath the eaves of buildings, bare or clay patches, or in lawn ruts where water might pool and reside a bit longer. Another easy way to locate plants is to search the soil at the base of crepe myrtles or Japanese maples in plantings or pots or at nurseries. Probably spread across the southeastern USA in pots or plantings from nurseries to cemeteries. The species is native to Asia and India, with first USA records from 1900 to 1930, again suggesting a late introduction. Its weedy habits account for its escapes and naturalization in nurseries and cemeteries. With these 27 county vouchers, the species is now known from 54 counties in Arkansas.

Voucher specimens: **ARKANSAS. Ashley Co.**: *Peck 96007* (BRIT). **Chicot Co.**: *Peck 96009* (BRIT). **Clay Co.**: *Peck 97058* (BRIT). **Conway Co.**: *Peck 99088* (BRIT). **Craighead Co.**: *Peck 97049* (BRIT). **Crittenden Co.**: *Peck 96038* (BRIT). **Cross Co.**: *Peck 96033* (BRIT). **Desha Co.**: *Peck 96015* (BRIT). **Drew Co.**: *Peck 96011* (BRIT). **Faulkner Co.**: *Peck 98085* (BRIT). **Greene Co.**: *Peck 97055* (BRIT). **Independence Co.**: *Peck 98073* (BRIT). **Jackson Co.**: *Peck 98075* (BRIT). **Lawrence Co.**: *Peck 98078* (BRIT). **Lee Co.**: *Peck 96023* (BRIT). **Mississippi Co.**: *Peck 97043* (BRIT). **Montgomery Co.**: *Peck 99097* (BRIT). **Perry Co.**: *Peck 99092* (BRIT). **Phillips Co.**: *Peck 96019* (BRIT). **Poinsett Co.**: *Peck 97046* (BRIT). **Polk Co.**: *Peck 99095* (BRIT). **Pope Co.**: *Peck 99110* (BRIT). **Pulaski Co.**: *Peck 96005* (BRIT). **Randolph Co.**: *Peck 98065* (BRIT). **St. Francis Co.**: *Peck 96027* (BRIT). **Woodruff Co.**: *Peck 98082* (BRIT). **Yell Co.**: *Peck 99105* (BRIT).

WINGED BEECH FERN – **Phegopteris decursive-pinnata** (H.C. van Hall) Fee (Thelypteridaceae)—This non-native species is an exceptionally attractive hardy fern (Hoshizaki & Moran 2001; Mickel 2003). It occurred spontaneously at Garvan Woodland Gardens, Hot Springs, in Garland Co. The species was not planted but has shown up in a rock-lined water pool on sandstone rocks. It may have been brought

to the garden in potting soils of other cultivated and planted ferns. Thus it may have been brought to the garden unintentionally. The rocks were obtained locally and thus were not the source. The species is not available locally but is grown at the production nursery in Texas where many of the hardy ferns were obtained. It may spread further around this hardy fern display garden. This is the first report of this species naturalizing in Arkansas.

Voucher specimen: **ARKANSAS. Garland Co.**: *Peck 2010236* (BRIT).

KOREAN ROCKFERN -- **Polystichum tsus-simense** (Hooker) J. Smith var. **mayebarae** (Tagawa) Sa. Kurata (Dryopteridaceae)—This non-native species is an exceptionally attractive fern for rock gardens (Hoshizaki & Moran 2001; Mickel 2003). It occurred spontaneously twice in a terrestrial rock garden in Garvan Woodland Gardens, Hot Springs, Garland Co. The species is available locally. It grows in cultivation at the production nursery in Texas from where many hardy fern plants were obtained to stock this garden. The sandstone rocks were obtained locally. It is presumed that it was unintentionally brought to the garden in planting soil or on other fern specimens. While escaping from cultivation, the slowness of the growth and the degree of moderation required for summer survival in Arkansas makes the likelihood of this species becoming of invasive concern seem quite remote. This is the first report of this species naturalizing in Arkansas.

Voucher specimen: **ARKANSAS. Garland Co.**: *Peck 2010239* (BRIT).

SPIDER BRAKE -- **Pteris multifida** Lam. (Pteridaceae)—This cultivated fern was reported from Arkansas by Chandler (1941) as naturalized and growing on the calcareous tuffa outcrops behind the historic bath house row at Hot Springs National Park, Garland Co. The second report of this species naturalizing as an escape from cultivation in Arkansas was from the Carl Amason property outside Calion, Union Co. (Sundell, Thomas, Amason, Stuckey, & Logan 1999). A third instance was noted by Eric Sundell in Alsopp Park within the city limits of Little Rock, Pulaski Co. This apogamous species, native to eastern Asia, is readily capable of producing new sporophytes from single spores. The species is now known as naturalized in three Arkansas counties.

Voucher specimens: **ARKANSAS. Garland Co.**: *Taylor 2708* (SIU). **Pulaski Co.**: *Sundell 18346* (ANHC). **Union Co.**: *Witsell 050128* (ANHC).

LEAST WATER SPANGLES – **Salvinia minima** Baker (Salviniaceae)—This small water garden fern is native to Central America, Mexico, and the West Indies. It is arguable whether this species is native to the USA. It has since become naturalized and spread from Florida west to Texas and north to Georgia. Greenhouse plants were reported from Minnesota but were not native, naturalized, or persistent. The species was first discovered in Arkansas in Lonoke County in 1998 by the author (Peck 1999, 2001) and it is now known from 13 counties. Strong cold winters, intense droughts, and years with twice normal rainfall have reduced the size of local infestations. This non-native species is not nearly hardy or weedy enough to be regarded as invasive.

Voucher specimens: **ARKANSAS. Arkansas Co.**: *Peck 99003, 99004* (BRIT). **Chicot Co.**: *Peck 20000214* (BRIT). **Desha Co.**: *Peck 99574* (BRIT). **Garland Co.**: P*eck 2004260* (BRIT). **Hot Spring Co.**: *Peck 2004245* (BRIT). **Jefferson Co.**: *Peck 99562* (BRIT). **Lee Co.**: *Peck 99583* (BRIT). **Lincoln Co.**: *Peck 99570* (BRIT). **Lonoke Co.**: *Peck 98002, 99001* (BRIT). **Monroe Co.**: *Peck 99588* (BRIT). **Phillips Co.**: *Peck 99579* (BRIT). **Prairie Co.**: *Peck 99002* (BRIT). **Pulaski Co.**: *Peck 99650* (BRIT).

GIANT WATER SPANGLES – **Salvinia molesta** D.S. Mitchell (Salviniaceae)—This non-native species was introduced probably from Brazil into the water garden trade of the USA in Florida and has since escaped and spread northward up the Atlantic coastal plain to South Carolina and westward along the Gulf Coastal states to Texas (Jacono 1999a, 1999b). Identification of non-native *Salvinia* have remained problematic as they are sometimes difficult to identify, have a long history in the commercial water garden trade, appear to readily escape from cultivation, increasing their ranges into areas where they were not known, and differ in degree of invasiveness (Riefner & Smith 2009). Until recently, all *Salvinia* in Arkansas were assigned to *S. minima* Baker (Peck 1999, 2001). Since then, two stations with *Salvinia molesta* were discovered, one in extreme southwest Arkansas and a second in central Arkansas. In 2008 a small population was located in McKinney Bayou of the Red River in the Sulphur Bottoms, Miller Co. The area is a flood plain with cut-off meander scars forming small ponds and lakes in low land woods or swamps. In 2009, a patch of plants was found floating down the Little Maumelle River at Little Rock, in Pulaski Co. Upstream the river is dominated with cypress swamps and contains a high diversity of emergent vegetation. The plants in Miller Co. were probably spread by waterfowl; those in Pulaski Co. may have been transported there by fishing boats or waterfowl. This extends the range some 300 km north from Louisiana and Texas. This is the first report of this species naturalizing in Arkansas. Strong cold winters, intense droughts, and flood years with twice normal rainfall have reduced the size of local infestations but may have just flushed or transferred the problem downstream. This non-native species has been regarded as a notorious, highly invasive weed. Its status and fate in Arkansas remains to be seen.

Voucher specimens: **ARKANSAS. Miller Co.**: *Peck 20080851* (BRIT). **Pulaski Co.**: *Peck 20090923* (BRIT).

BRAUN'S SPIKEMOSS – **Selaginella braunii** Baker (Selaginellaceae)—This species was brought into cultivation in China and is commonly grown across the southeastern USA (Hoshizaki & Moran 2001; Mickel 2003) where it has naturalized. Known in the Arkansas trade as Arborvitae Fern, it grows into a reasonably thick ground cover. It has escaped from cultivation within Garvan Woodland Gardens in Garland Co. and has escaped from an unknown source and become naturalized in Alsopp Park, Little Rock, in Pulaski Co. The species is somewhat drought sensitive and winter sensitive in Arkansas, and it certainly is not aggressive enough to have much invasive potential. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010113, 2010272* (BRIT). **Pulaski Co.**: *Peck 2010118* (BRIT).

KRAUSS'S SPIKEMOSS – **Selaginella kraussiana** (Kunze) A. Braun (Selaginellaceae)—This species is native to Africa and is one of the most common spikemosses cultivated in greenhouses (glasshouses). It is hardy and cultivated across the southeastern USA and is known to escape and naturalize there (Hoshizaki & Moran 2001; Mickel 2003). Besides the typical species, a handful of cultivars have been brought into cultivation and are also widely grown. It has escaped from cultivation within Garvan Woodland Gardens in Garland Co. and has escaped from an unknown source and become naturalized in Alsopp Park, Little Rock, in Pulaski Co. The species is somewhat drought sensitive and winter sensitive in Arkansas, and it certainly is not aggressive enough to have much invasive potential. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010115, 2010242* (BRIT). **Pulaski Co.**: *Peck 2010120, 2010243* (BRIT).

GOLDEN SPIKEMOSS – **Selaginella kraussiana** (Kunze) A. Braun 'Aurea' (Selaginellaceae)—This cultivar is entirely golden in color, contrasting with the darker green of the next cultivar or only the tips being golden in the latter cultivar. It has escaped from cultivation within Garvan Woodland Gardens in Garland Co., and has escaped from an unknown source and become naturalized in Alsopp Park, Little Rock, in Pulaski Co. The species is somewhat drought sensitive and winter sensitive in Arkansas, and it certainly is not aggressive enough to have much invasive potential. This is the first report of this cultivar naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010241* (BRIT). **Pulaski Co.**: *Peck 2010240* (BRIT).

PINCUSHION SPIKEMOSS – **Selaginella kraussiana** (Kunze) A. Braun 'Brownii' (Selaginellaceae)—This cultivar is more compact, more bushy, darker green, and more erect than the species or its other cultivars. It is known in the hardy fern trade as Pincushion Fern. It has escaped from cultivation within Garvan Woodland Gardens in Garland Co. and has escaped from an unknown source and become naturalized in Alsopp Park, Little Rock, in Pulaski Co. This distinct cultivar has spread from spores into the lawn, across the lawn by lawn mower, and down slope from water flow. The species is somewhat drought sensitive and winter sensitive in Arkansas, and it certainly is not aggressive enough to have much invasive potential. This is the first report of this cultivar naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010117* (BRIT). **Pulaski Co.**: *Peck 2010121* (BRIT).

GOLDTIPS SPIKEMOSS – **Selaginella kraussiana** (Kunze) A. Braun 'Goldtips' (Selaginellaceae)—This cultivar is readily identified by its main axis dark foliage contrasting with the tips of the stems with golden coloration. It has escaped from cultivation within Garvan Woodland Gardens in Garland Co. and has escaped from an unknown source and become naturalized in Alsopp Park, Little Rock, in Pulaski Co. The species is somewhat drought sensitive and winter sensitive in Arkansas, and it certainly is not aggressive enough to have much invasive potential. This is the first report of this cultivar naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010116* (BRIT). **Pulaski Co.**: *Peck 2010122* (BRIT).

PEACOCK SPIKEMOSS – **Selaginella uncinata** (Desv. ex Poir.) Spring (Selaginellaceae)—This spikemoss was brought into cultivation in China and is commonly planted in the southeastern USA where it is known to escape from cultivation (Hoshizaki & Moran 2001; Mickel 2003). When grown in low light habitats, plants of this species present blue-green iridescent foliage, leading to its name in the Arkansas trade as the Peacock Fern. It has escaped from cultivation within Garvan Woodland Gardens in Garland Co. and has escaped from an unknown source and become naturalized in Alsopp Park, Little Rock, in Pulaski Co. The species is somewhat drought sensitive and winter sensitive in Arkansas, and it certainly not aggressive enough to have much invasive potential. This is the first report of this species naturalizing in Arkansas.

Voucher specimens: **ARKANSAS. Garland Co.**: *Peck 2010114, 2010271* (BRIT). **Pulaski Co.**: *Peck 2010119* (BRIT).

KUNTH'S FERN – **Thelypteris kunthii** (Desv.) Morton (Thelypteridaceae)—This fern is common in northern South America, Central America, and the West Indies. It is common in the garden trade across the southeastern USA (Hoshizaki & Moran 2001; Mickel 2003). It is commonly planted as a landscape plant and frequently escapes. It was first discovered in Arkansas by David Johnson in 1975 in rural timber lands of Ashley Co. It was reported as naturalized by Taylor and Johnson (1979). Peck and Taylor (1995) reported it from 13 counties across southern Arkansas and another 13 counties are reported here.

Voucher specimens: **ARKANSAS. Bradley Co.**: *Peck 1997457* (BRIT). **Calhoun Co.**: *Peck 1998255* (BRIT). **Clark Co.**: *Peck 1998297* (BRIT). **Dallas Co.**: *Peck 1999369* (BRIT). **Garland Co.**: *Crank 92043* (Henderson). **Grant Co.**: *Peck 1999410* (BRIT). **Hot Spring Co.**: *Peck 1999488* (BRIT). **Izard Co.**: *Johnson 422* (HXC). **Jefferson Co.**: *Warriner 19900149-50* (BRIT). **Johnson Co.**: *Witsell 08311* (ANHC). **Pulaski Co.**: *Peck 1997267* (BRIT). **Saline Co.**: *Peck 1999626* (BRIT). **Stone Co.**: *Peck 1999391* (BRIT). **White Co.**: *Scudder sn* (HARD).

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